

Michigan Department of Environmental Quality

Final Report VA-CIP Project

December 31, 2008



Table of Contents

Table of Contents.....	i
List of Figures.....	ii
List of Tables	iii
Executive Summary	1
Section 1: Phase 1	1-1
1.1 Phase 1 Project Objectives	1-1
1.2 Process for Data Collection	1-1
1.3 Utility Response Rate.....	1-1
1.4 Results	1-2
1.4.1 Security Projects.....	1-2
1.4.2 Project Types	1-4
1.4.3 Project Costs	1-4
1.4.4 Policies and Procedures.....	1-6
1.4.5 Emergency Response Plan Updates.....	1-7
1.5 Conclusions	1-8
Section 2: Phase 2.....	2-1
2.1 Phase 2 Project Goals.....	2-1
2.2 Process for Data Collection	2-1
2.3 Utility Response Rate.....	2-1
2.4 Results	2-2
2.4.1 Security Projects.....	2-2
2.4.2 WARN Program	2-6
2.5 Conclusions	2-8
Section 3: Phase 3.....	3-1
3.1 Phase 3 Project Goal	3-1
3.2 Data Collection Procedures.....	3-1
3.3 Response Rate	3-2
3.4 Results	3-2
3.4.1 Documentation of Security Practices.....	3-2
3.4.2 Tabletop & Full-scale Exercises	3-7
3.4.3 Performance Metrics	3-8
3.4.4 Relationships with other Emergency Responders	3-9
3.4.5 Emergency Action Plan Training	3-10
3.4.6 Emergency Response Planning Challenges.....	3-12
3.4.7 Future Needs.....	3-14
3.5 Conclusions	3-15
Section 4: Recommendations	4-1
Appendix A: Letter from MDEQ to Utilities	A-1
Appendix B: Phase 1 Survey	B-1
Appendix C: Letter from MDEQ to Utilities.....	C-1
Appendix D: Survey.....	D-1
Appendix E: Letter from MDEQ Requesting Utility Participation in Phase 3.....	E-1
Appendix F: Phase 3 Survey Form.....	F-1
Appendix G: Selected Utility Comments Not Captured in Survey Database	G-1

List of Figures

Figure 1-1: Rate of Utility Participation in Project Survey	1-2
Figure 1-2: Completion Rate of Security Projects Identified by Vulnerability Assessments or post VA from 2002-2007	1-Error! Bookmark not defined.
Figure 1-3: Average Number of Projects Identified and Completed per Michigan Utility Based on the VA Report and Post-VA	1-4
Figure 1-4: Types of Projects Identified during VA, Post- VA and Future Needs	1-4
Figure 1-5: Total Amount Spent and Total Needed for Security Projects by Water Utilities in the State of Michigan	1-5
Figure 1-6: Expended and Needed Cost per Utility for Security Improvements	1-6
Figure 1-7: Percent of Utilities that Made Policy and Procedure Changes as a Result of the VA	1-6
Figure 1-8: Percent of Utilities with Modifications to Emergency Response Plans as a Result of the VA.....	1-7
Figure 2-1: Rate of Utility Participation in Project Survey	2-2
Figure 2-2: Number of Michigan Water Utility Security Projects Completed in 2007 and Planned in 2008/Future	2-3
Figure 2-3: Frequency of Security Project Type Completed by Michigan Water Utilities in 2007.....	2-4
Figure 2-4: Frequency of Future Security Project Type and Future Plans of Michigan Water Utilities	2-5
Figure 2-5: Security Project Costs Michigan Water Utilities.....	2-6
Figure 2-6: Plan to Participate in WARN Program.....	2-7
Figure 2-7: Frequency of Reasons for Non-Participation in WARN	2-8
Figure 3-1: Frequency that Utilities Update Emergency Response Plans (Percent).....	3-3
Figure 3-2: Percent of Utilities with a Consequence Management Plan.....	3-4
Figure 3-3: Frequency of Reported Problems with Updating ERPs.....	3-5
Figure 3-4: Frequency of Different Scenarios Addressed by ERPs.....	3-6
Figure 3-5: Percent of Utilities with Prepared Emergency Messages on Water Use....	3-7
Figure 3-6: Utility Frequency of Involvement in Tabletop and Full-scale Exercises to Address Emergency Scenarios.....	3-8
Figure 3-7: Number of Utilities with Assessment of Exercises for Emergency Scenarios	3-9
Figure 3-8: Percent of Utilities with Formal Agreements or Interactions with Other Organizations for Emergency Response	3-10
Figure 3-9: Frequency of Utility Personnel Training on ERPs	3-11
Figure 3-10: Percent of Utilities with at Least One Staff Person Trained in NIMS.....	3-12
Figure 3-11: Percent of Utilities Interested in Assistance with Emergency Management Templates or Exercises	3-15

List of Tables

Table 1-1: Population Served by Participating Utilities	1-2
Table 1-2 Number of Security Projects Completed by Water Utilities from 2002-2007	1-3
Table 1-3: Number of Utilities that Made Policy and Procedure Changes as a Result of the VA	1-7
Table 1-4: Number of Utilities that made Policy and Procedure Changes as a Result of the VA	1-8
Table 2-1: Population Served by Participating Utilities	2-2
Table 3-1: Population Served by Participating Utilities	3-1
Table 3-2: Utility Participation and Retention Rates in All Phases of VA-CIP Project 3-2	
Table 3-3: Frequency that Utilities Update Emergency Response Plans (Number).....	3-4
Table 3-4: Number of Utilities with a Consequence Management Plan.....	3-4
Table 3-5: Number of Responses for Common Utility Problems with Updating ERPs.....	3-5
Table 3-6: Number of Scenarios Addressed in Utility ERPs.....	3-6
Table 3-7: Number of Utilities with Prepared Emergency Messages on Water Use....	3-7
Table 3-8: Number of Utilities Involved in Tabletop and Full-scale Exercises to Address Emergency Scenarios.....	3-8
Table 3-9: Number of Utilities with Formal Agreements or Interactions with Other Organizations for Emergency Response	3-10
Table 3-10: Number of Utilities with ERP Training Frequencies.....	3-11
Table 3-11: Number of Utility Staff Trained in NIMS	3-12
Table 3-12: Number of Utilities Interested in Templates	3-14

Executive Summary

Drinking water utilities in the State of Michigan were surveyed regarding their emergency preparedness and management. The surveys specifically addressed the implementation and future needs derived from the utilities' Vulnerability Assessments [VA (United States' Bioterrorism Act of 2002)].

The project was divided into three phases. The first phase included site visits and a survey to assess project identification and implementation following the VAs. Phase 2 consisted of a survey administered to assess ongoing planning and needs for infrastructure related to security and to assess the utility familiarity and interest in the evolving Michigan WARN (Water and Wastewater Agency Response Networks) program. The final phase addressed emergency management, including documentation, practices and procedures.

A total of 293 Michigan community drinking water utilities of all sizes were contacted and requested to participate in this project. Of the original list, 216 participated in Phase 1, 130 in Phase 2 and 102 in Phase 3.

In Phase 1, utilities were surveyed to assess their implementation of recommendations from their VA. Between 2002-2006, utilities had completed 66 percent of their VA identified projects. An additional 175 projects had been identified after completion of the VA. Therefore, a total of 1,899 security projects from 216 different utilities were identified – of which 1,244 have been completed. On average, each utility completed five projects resulting from the VA and has identified less than one project post VA. Typical projects included locks, fences, cameras, motion detectors, card key access and emergency power generators. Project costs were requested, and some utilities were able to provide data. Completed project costs ranged from \$100 for new locks to \$5 million for new generators. Ninety-one Michigan water utilities have spent more than \$12 million on security projects and still need more than \$16 million for additional projects. In Phase 1, utilities were also asked about their emergency policies and procedures. Sixty-seven percent updated these as a result of the VA, while emergency response plans were updated by 38 percent.

In Phase 2, utilities were surveyed on current year 2007 completed VA projects and projected future projects. Specifically, budget expenditures and needs were captured along with project types. Utilities were spending a wide range of funds on security, ranging from \$50 for locks to more than \$12 million for a comprehensive security project. On average, utilities were spending about \$375,000 per year in 2007 for security and needed almost \$400,000 per utility in the near future. Based on participation in the survey by 31 utilities, this equates to approximately \$12 million per year for these utilities. Utilities were also surveyed regarding knowledge of and anticipated participation in the evolving Michigan WARN program. While 37 utilities indicated an interest in participation, 89 did not primarily because of lack of familiarity.

The main topics addressed in Phase 3 included documentation, practice and procedures related to emergency management. Most utilities perform some level of routine updating of their emergency response plans (ERPs), although the frequency and extent of these updates varied. Common problems with updating ERPs included obtaining current contact information and lack of time. ERPs addressed a wide variety of scenarios, including natural disasters, alternative water supply, distribution system contamination and power outages. Boil water notice templates were common. Utilities were generally unaware of the requirements for a consequence management plan and very few utilities had developed one. Tabletop exercises were performed by more than half of the utilities but with varying frequency. Full-scale exercises were uncommon. Performance metrics for assessing success of exercises were largely nonexistent. However, most utilities had formal relationships with at least Police and Fire for emergency response. Utilities also provided some routine frequency of staff training on ERPs, but almost half had no National Incident Management System (NIMS) -trained personnel.

Based on project survey results, a number of recommendations can be made to enhance utility emergency management and security project implementation. Assistance with identifying funding opportunities and completing applications for grants would be a benefit to utilities as funding for security was frequently noted as a challenge. Education on the existence of the WARN program should be conducted. Routine updating of ERPs, policies and procedures should be promoted. Combining consequence management plans into the ERP to form a single document, accompanied by utility education on content, would be a benefit. It was also noted during the survey that there are a wide variety of scenarios that utilities have included in their ERPs and that sharing, prioritization and template preparations for these scenarios could benefit Michigan utilities. Similarly, this approach for relationships with other organizations, such as the medical community, could be developed and shared. Assistance with tabletop exercises would help utilities with preparedness and could be combined with developing and applying performance metrics to assess success. In general, utilities were receptive to any template or instructional opportunity that would reduce their time commitment while providing enhancements to their emergency management programs.

Section 1: Phase 1

1.1 Phase 1 Project Objectives

The MDEQ initially identified 288 water utilities in the State of Michigan for site visits by CDM Michigan Inc. and Michigan Rural Water Association (MRWA). The purpose of these site visits was to interview utility staff on the progress of water security improvements identified during the utility's VA and post-VA. The completion rate of the projects was assessed and remaining needs identified. Information was collected on the types of projects and approximate costs where available. In addition, the utilities provided information on whether they updated policies, procedures and emergency response plans as part of their VA and as later activities. The intent of this project was to assess the utility accomplishments and to recognize remaining needs for security capital improvement projects. Community water systems including large, medium and small supplies were surveyed.

This project phase occurred during September 15, 2006 – September 27, 2007.

1.2 Process for Data Collection

All information was treated as confidential, and all utilities were assigned a unique identifier.

Utilities were contacted by phone, fax and/or e-mail. Three attempts were made, using multiple methods, to contact all utilities. Participation was voluntary. After three contacts, utilities were considered to be non-responsive. Information on the program and a two-page survey were included when the utilities were contacted (see Appendices A and B). Utilities were scheduled for a site visit by either CDM or MRWA so that a survey could be completed. Optionally, they were offered the opportunity to complete the form independently and return it via fax or e-mail. Utilities that selected this option typically required phone consultation to help complete the form. A few utilities requested that the survey be completed exclusively via phone interview.

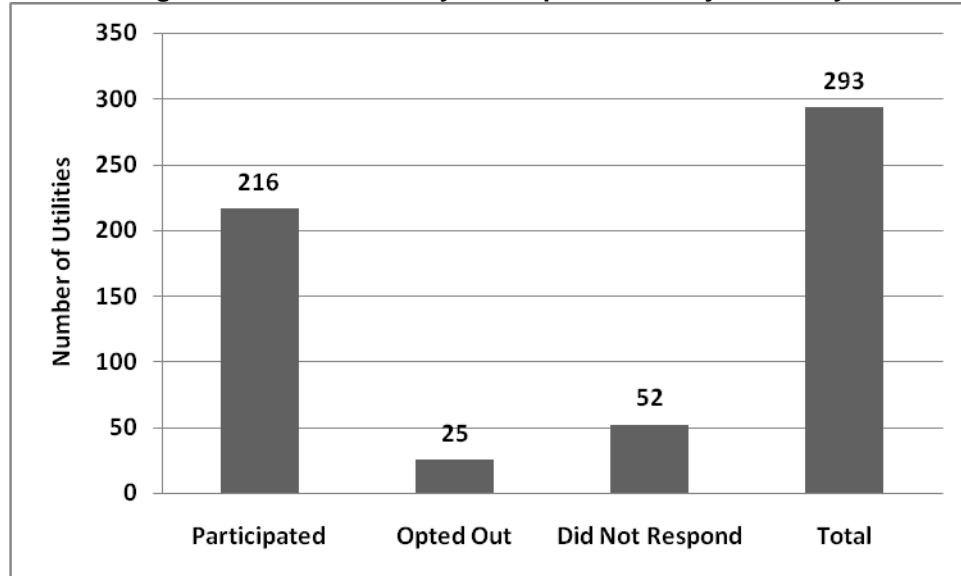
The data received from the utilities was captured on a hard copy form and then entered into an Access database for data analysis. The database captured the unique ID, the evaluator, the role of the person interviewed, interview attendees, date of contact, type of contact, number of projects identified in the VA, number of projects completed, number of projects identified post-VA, number of post-VA identified projects completed and any comments. Comments included details on projects and cost estimates if available.

1.3 Utility Response Rate

The initial list supplied by the MDEQ was reviewed and some additional contacts added, resulting in a list of 299 utilities. Of these, six were a part of another system and participated as a single unit. Therefore, the final number of potential participants was 293, of which 216 (74 percent) participated in the study (Figure 1-1). A number

either did not respond or indicated that they would complete the survey but failed to deliver it on time (total number 52 or 18 percent). Twenty-five (9 percent) of utilities declined to participate in the survey.

Figure 1-1: Rate of Utility Participation in Project Survey



The utility size based on population served is presented in Table 1-1. This distribution is fairly representative of the utility size distribution in Michigan. A small number of utilities provided insufficient information to be able to determine their population size.

Table 1-1: Population Served by Participating Utilities

Population Served	Number of Utilities Responding to the Survey	Percent of Utilities Completing the Survey
1 – 5,000	55	25%
5,001 – 10,000	53	25%
10,001 – 50,000	76	35%
50,001 – 100,000	10	5%
>100,001	6	3%
Utility not identified	14	6%

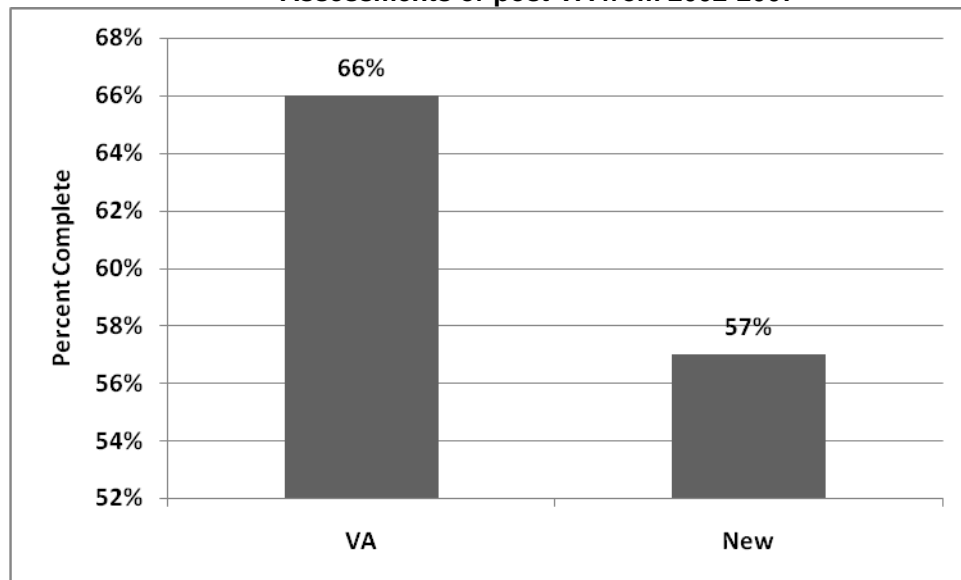
1.4 Results

1.4.1 Security Projects

In Michigan, a total of 1,724 projects were identified in the VAs and 175 post-VA (Table 1-2 and Figure 1-2). Michigan water utilities identified a total of 1,899 security projects ranging from the addition of new locks to emergency generators.

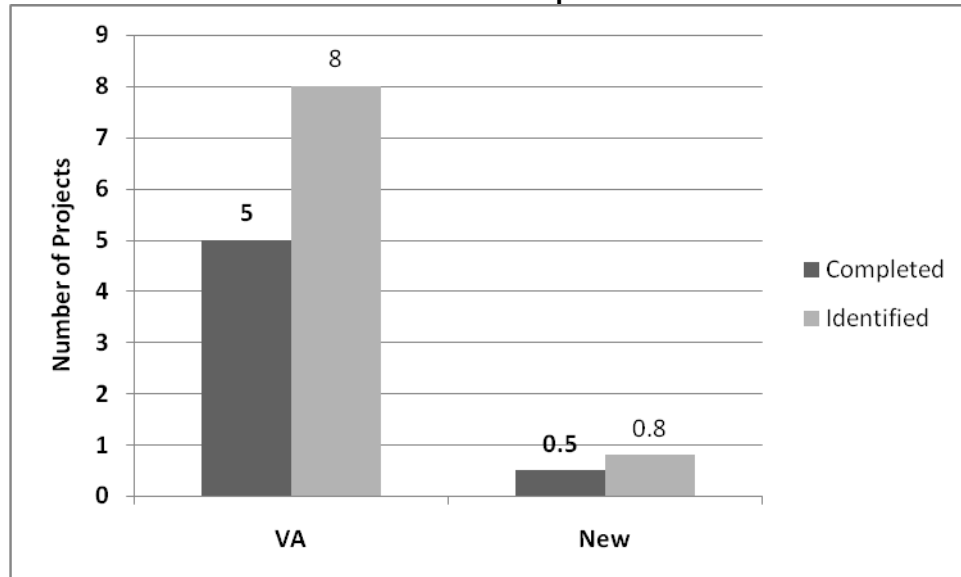
Table 1-2 Number of Security Projects Completed by Water Utilities from 2002-2007			
	From VA	Post VA	Total
Number of Projects Identified	1,724	175	1,899
Number of Projects Completed	1,138	100	1,244
Number of Projects for Future	586	75	661

Figure 1-2: Completion Rate of Security Projects Identified by Vulnerability Assessments or post VA from 2002-2007



Of these projects, the majority have been completed. Sixty-six percent of the projects identified as part of the VAs have been completed, and 57 percent of security projects identified at a later date have been accomplished (Figure 1-3). The most common reasons for not completing projects included lack of funding, lack of staff time and inability to implement the project. In some instances, utilities found that initial plans proved impractical or impossible to complete. Therefore, a total of 1,244 security based projects have been completed to enhance the security of water utilities in Michigan. The data collected indicate that Michigan utilities identified on average eight projects per utility from their VA and completed on average five projects per utility (Figure 1-3). The utilities continued to identify projects post-VA, demonstrating a continued effort in security enhancements. On average, slightly less than one project per utility was identified and completed post-VA.

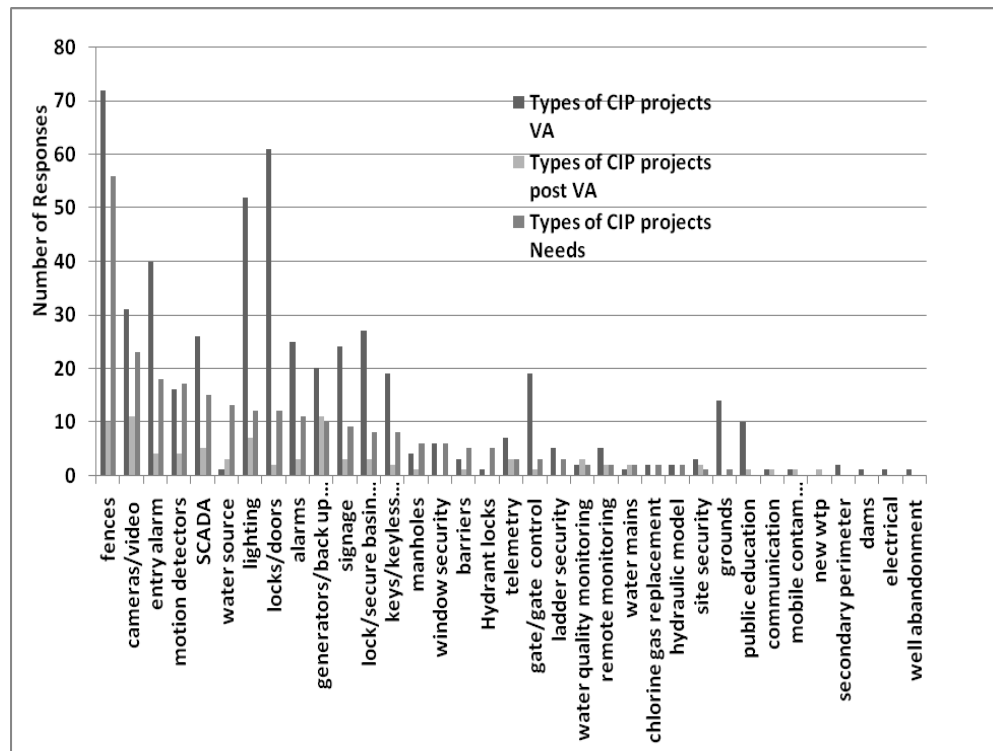
Figure 1-3: Average Number of Projects Identified and Completed per Michigan Utility Based on the VA Report and Post-VA



1.4.2 Project Types

Typical projects included locks, fences, cameras, motion detectors, card key access and emergency power generators (Figure 1-4).

Figure 1-4: Types of Projects Identified during VA, Post- VA and Future Needs



1.4.3 Project Costs

Project costs ranged from \$100 for new locks to \$5 million for new generators to supply power backup. In the State of Michigan, water utilities have spent more than \$12 million on security-based projects, but still estimate they need more than \$16 million to complete additional security enhancements (Figure 1-5). This is the equivalent of spending \$135,000 per utility, with a remaining \$586,000 per utility needed based on the survey participants (Figure 1-6). Ninety-one utilities were able to supply approximate costs for the VA projects, eight for post-VA projects and 28 for future needs. Because of this response rate, project costs were pursued in more detail in the next phase of the project.

Figure 1-5: Total Amount Spent and Total Needed for Security Projects by Water Utilities in the State of Michigan

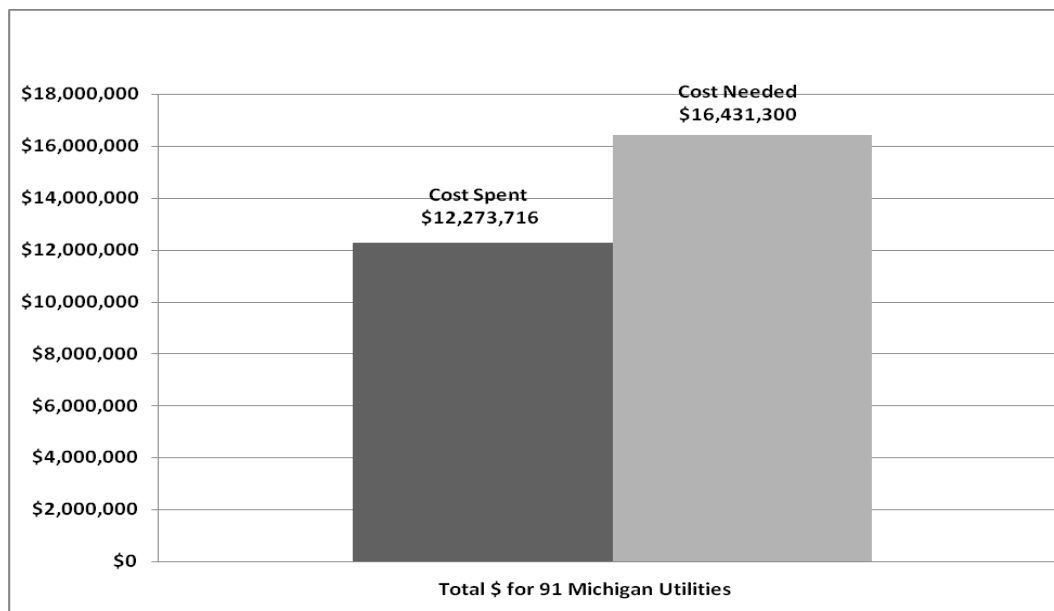
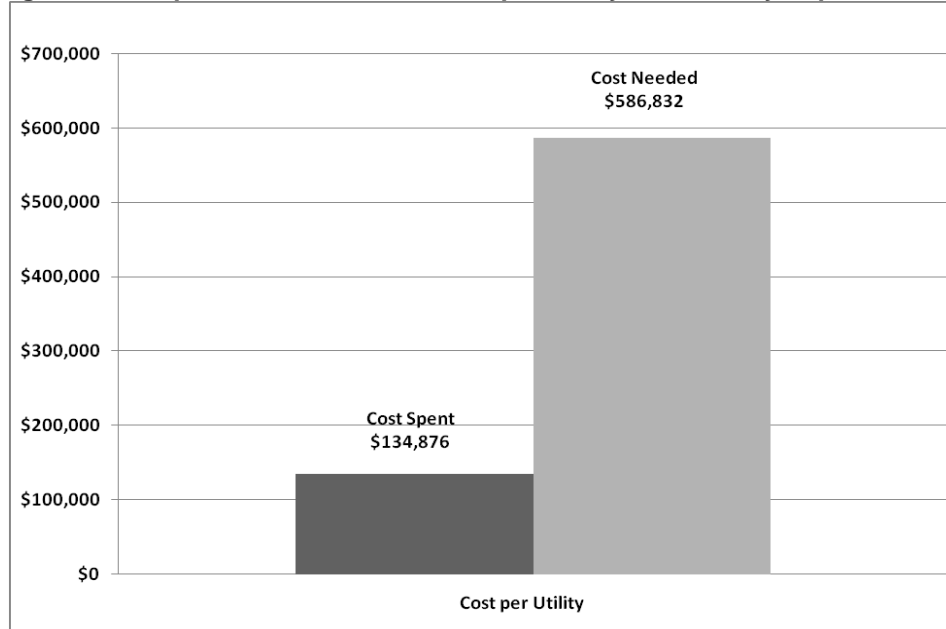


Figure 1-6: Expended and Needed Cost per Utility for Security Improvements



1.4.4 Policies and Procedures

Sixty-seven percent of utilities modified their policies and procedures as part of their VA (Figure 1-7 for percentage and Table 1-3 for number). Thirty percent did not update their ERPs as a result of the VA recommendations.

Figure 1-7: Percent of Utilities that Made Policy and Procedure Changes as a Result of the VA

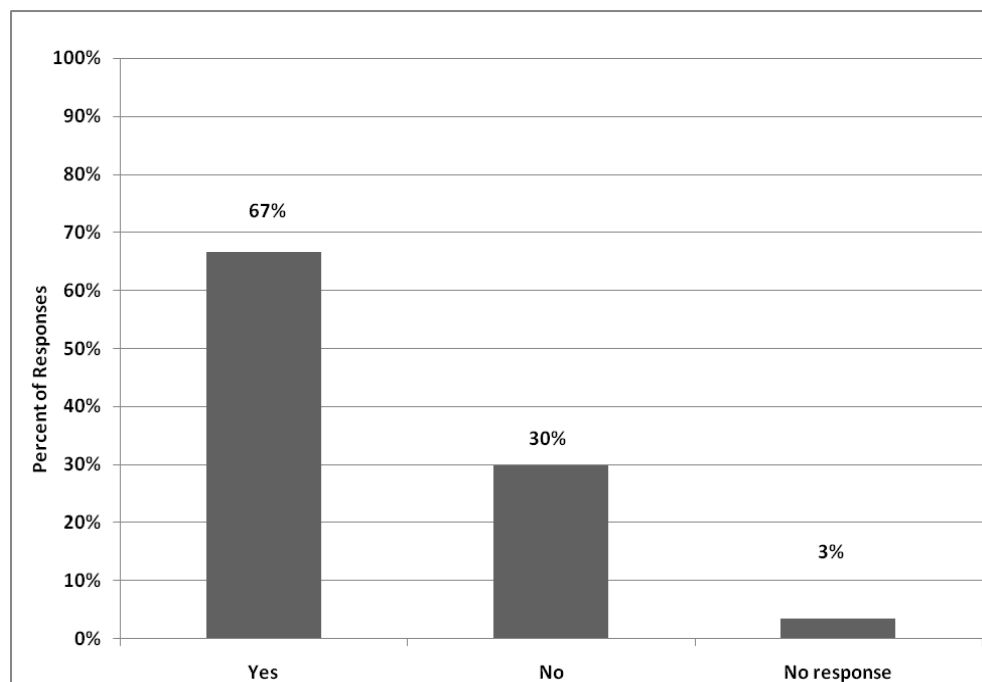


Table 1-3: Number of Utilities that Made Policy and Procedure Changes as a Result of the VA	
Number of Utilities with Policy and Procedure Changes	
Yes	136
No	61
No Response	7

1.4.5 Emergency Response Plan Updates

Thirty-eight percent of utilities updated their ERPs. However, this was often a routine update and not just driven by the VA (Figure 1-8 for percentage and Table 1-4 for number). Fifty-eight percent did not update these plans, and 4 percent were unsure if this had been done.

Figure 1-8: Percent of Utilities with Modifications to Emergency Response Plans as a Result of the VA

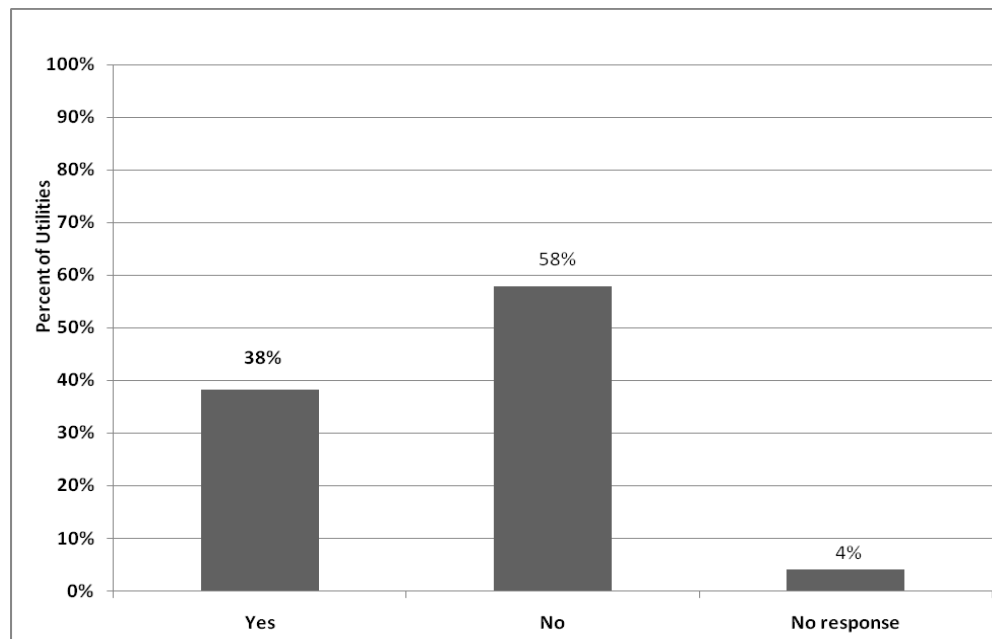


Table 1-4: Number of Utilities that made Policy and Procedure Changes as a Result of the VA	
Number of Utilities that Modified Emergency Response Plan	
Yes	78
No	118
No Response	8

1.5 Conclusions

Utilities demonstrated both implementation of security-based capital improvement projects as well as identification of future needs. Utilities had completed 66 percent of their VA-identified projects, which totaled 1,244 individual finished projects. An additional 175 projects had been identified after completion of the VA, with 100 of them being completed. Remaining needs identified totaled 661 projects at the time of this survey. On average, each utility completed five projects resulting from the VA and has identified less than one project post-VA. Typical projects included locks, fences, cameras, motion detectors, card key access and emergency power generators. Project costs were requested, and some utilities were able to provide data. Completed project costs ranged from \$100 for new locks to \$5 million for new generators. Ninety-one Michigan water utilities have spent more than \$12 million on security projects and need more than \$16 million for additional projects. In Phase 1, utilities were also asked about their emergency policies and procedures. Sixty-seven percent updated these as a result of the VA, while 38 percent of ERPs were updated as a result of the VA.

Section 2: Phase 2

2.1 Phase 2 Project Goals

Phase 2 of this project was developed to understand the continued interest and investment in security post-VA, specifically as related to physical infrastructure and projects. The intent of this project was to capture the utility involvement in Michigan with ongoing security enhancements. A secondary goal was to assess utility interest in the upcoming Michigan WARN program.

The data collection period for Phase 2 occurred during September 27, 2007 – June 30, 2008.

2.2 Process for Data Collection

All utilities that participated in the first phase of the project were included in the second phase. All information was treated as confidential. All utilities were assigned a unique identifier. The identifier in Phase 2 was the same as that used in Phase 1.

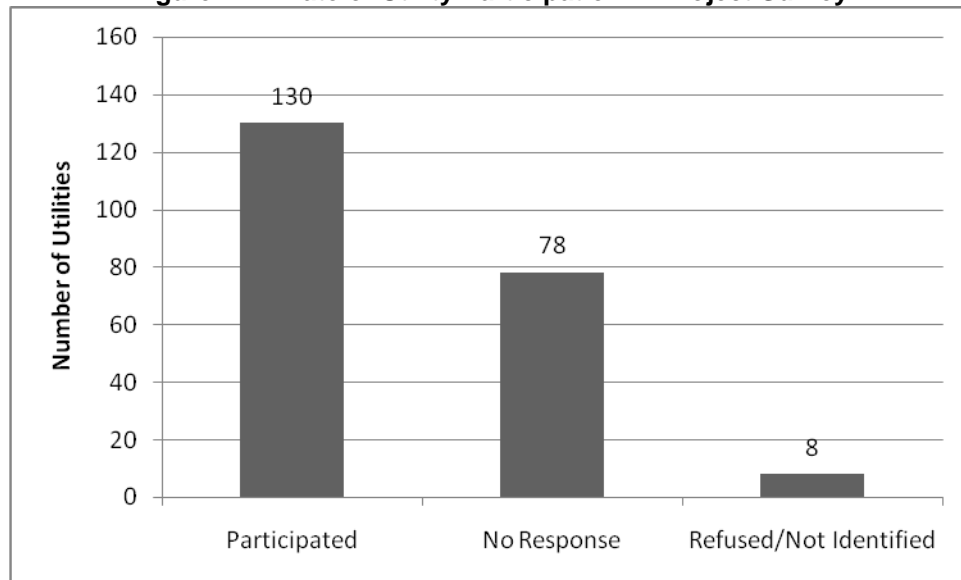
Utilities were contacted by e-mail, fax, regular mail and/or phone – in that order. Two approaches were attempted, using first an e-mail or hard copy contact, followed by individual phone calls as needed. Participation was voluntary. After two methods of contact were attempted, utilities were considered to be non-responsive. Information on the program and a two-page survey were included when the utilities were contacted (see Appendices C and D).

The data received from the utilities was captured on a hard copy form and then entered into an Excel database for data analysis. The database captured the unique ID and the responses to the survey questions.

2.3 Utility Response Rate

The list of participating utilities from Phase one was used as the database for Phase two contacts. A total of 216 utilities were on this list. Of these, 130 utilities (60 percent) participated in the Phase 2 survey (Figure 2-1). Two refused participation; six could not be identified from Phase 1, and the remainder were non-responsive. Participating utilities covered a wide range of small to large systems and distribution only to complex treatment plants so this response rate was deemed acceptable.

Figure 2-1: Rate of Utility Participation in Project Survey



Phase 2 achieved good coverage of utilities, which was comparable to that achieved in Phase 1 (Table 2-1).

Table 2-1: Population Served by Participating Utilities

Population Served	Number of Utilities Responding to the Survey	Percent of Utilities Completing the Survey
1 – 5,000	33	25%
5,001 – 10,000	34	26%
10,001 – 50,000	42	32%
50,001 – 100,000	8	6%
>100,001	5	4%
Utility not identified or refused	8	6%

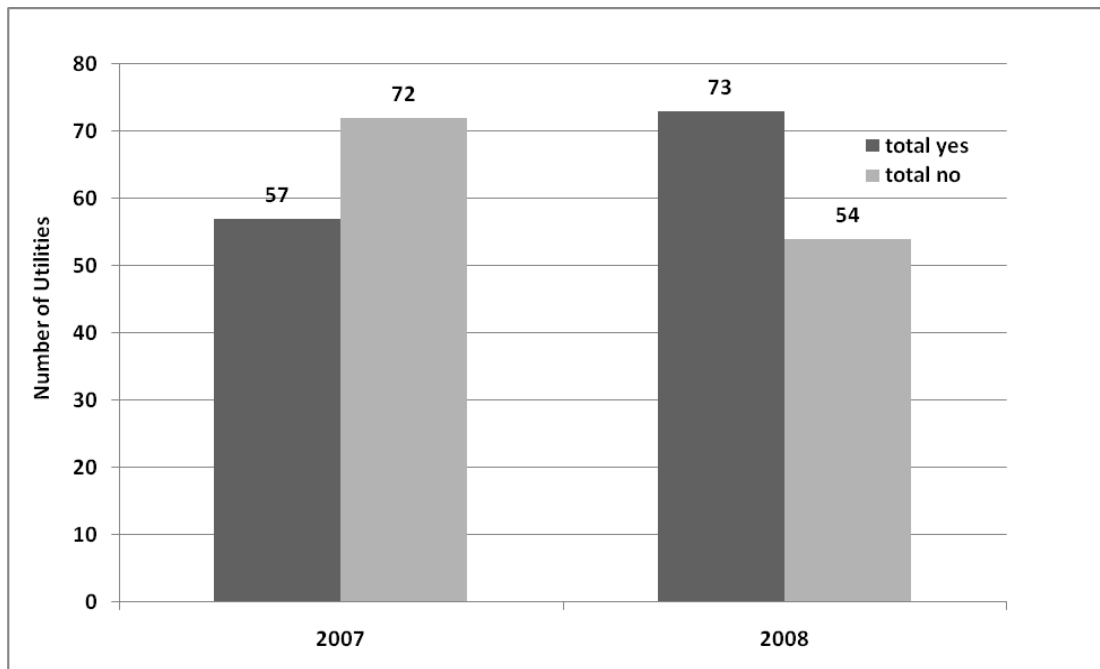
2.4 Results

2.4.1 Security Projects

Michigan utilities were asked about their current 2007 projects that related to security. They were also asked about future plans (2008 and beyond) regarding security related projects. For 2007, 57 utilities (out of 131 respondents) indicated that they had a security project in progress or had completed one recently. Therefore, 44 percent of the utilities surveyed had current security-based initiatives. The remaining 56 percent did not have current projects. Qualitatively, it was observed that many of these utilities commented that they had already completed the projects they felt were necessary to address security. Many of these utilities also reported that they were distribution only, so they had limited need for security enhancements.

73 utilities had future planned security enhancements; 54 had no projects planned (Figure 2-2). Availability of information on the timing and funding of these projects varied. A total of 56 percent of utilities were planning for additional security enhancements, while 42 percent had no projects identified. The same qualitative comments applied to future plans as observed for 2007 data.

Figure 2-2: Number of Michigan Water Utility Security Projects Completed in 2007 and Planned in 2008/Future

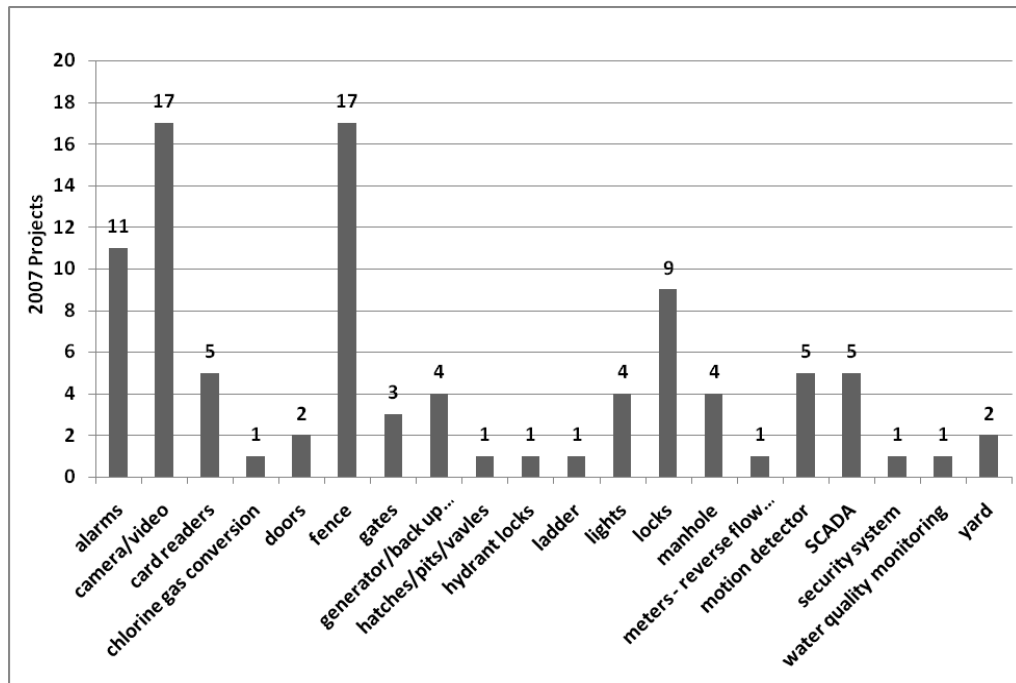


It is apparent from these data that many utilities are continuing to provide ongoing security projects to enhance their system. One utility commented that “security projects are just a routine part of the budget, like chemicals.” Another utility commented that security is a routine part of all projects and is no longer identified as a separate component. These and similar comments reflect an integration of security into routine utility functions.

Of the utilities that performed projects in 2007 or had ones planned in the future, the survey inquired about the type of project. Project types were developed based on the descriptors used in Phase 1 of the project. Fencing of facilities and some form of camera/video surveillance were the most common projects during 2007.

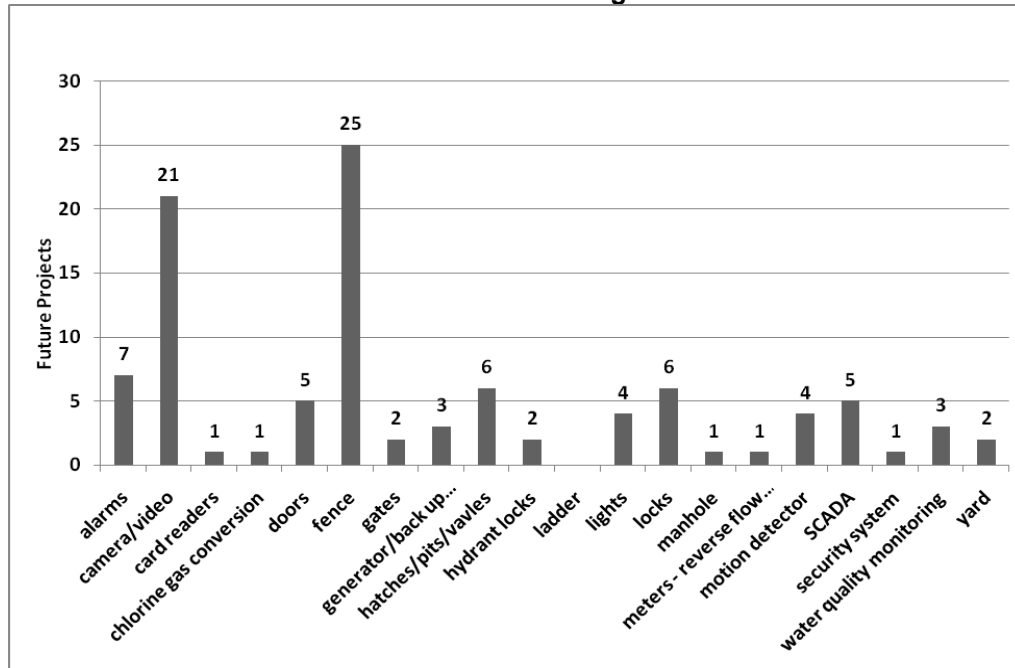
The next most common projects were enhanced alarm capabilities and improvements/ replacements of locks on facilities. All other projects had a low frequency of occurrence (Figure 2-3).

Figure 2-3: Frequency of Security Project Type Completed by Michigan Water Utilities in 2007



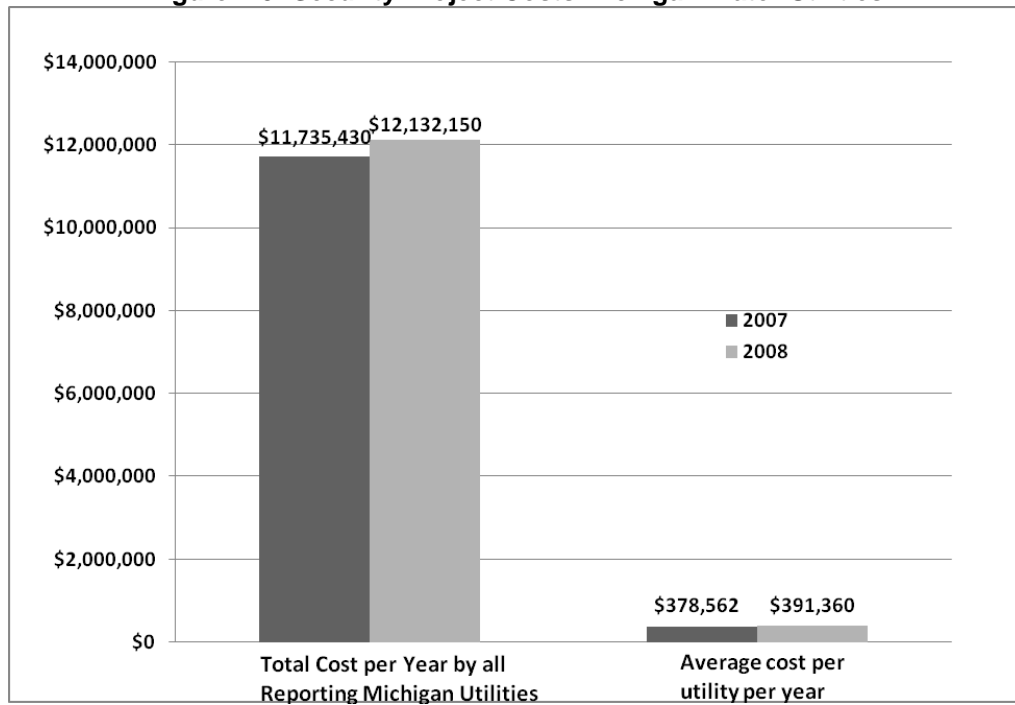
Future plans reflected the 2007 projects, with the most common projects being fencing and camera/video surveillance (Figure 2-4). A focus on physical restrictions and detection was favored by most utilities.

Figure 2-4: Frequency of Future Security Project Type and Future Plans of Michigan Water Utilities



The survey asked if utilities had a budget figure for 2007 projects and future projects. Thirty-one utilities were able to provide cost estimates for their 2007 projects. These costs ranged from \$50 for new locks to \$11,735,430 for a comprehensive project that included new generators, new gates and SCADA improvements (Figure 2-5). On average, utilities were spending almost \$375,000 each per year for security projects. However, this figure is likely skewed high because of a couple of multi-million dollar projects reported. For future plans, a total of 31 utilities provided estimated budget costs. Costs ranged from \$500 for new locks to just more than \$12 million for a comprehensive security project that included cameras, fencing, card readers, lighting improvements and other physical security enhancements. From these data, a future average projected cost of \$390,000 per utility was calculated. Planning data seldom existed beyond one or two years in the future, so this figure is an approximate annual cost. These costs, both expended and planned, are higher than those reported in Phase 1 of this project. This difference may be due to a number of factors: Phase 2 focused specifically on 2007 and 2008 where costs may be better known than in Phase 1, which covered multiple years. The response rate by system size may have varied because site visits were made to small utilities by MRWA in Phase 1, or the difference is number of utilities providing cost information (91 in Phase 1 vs. 31 in Phase 2).

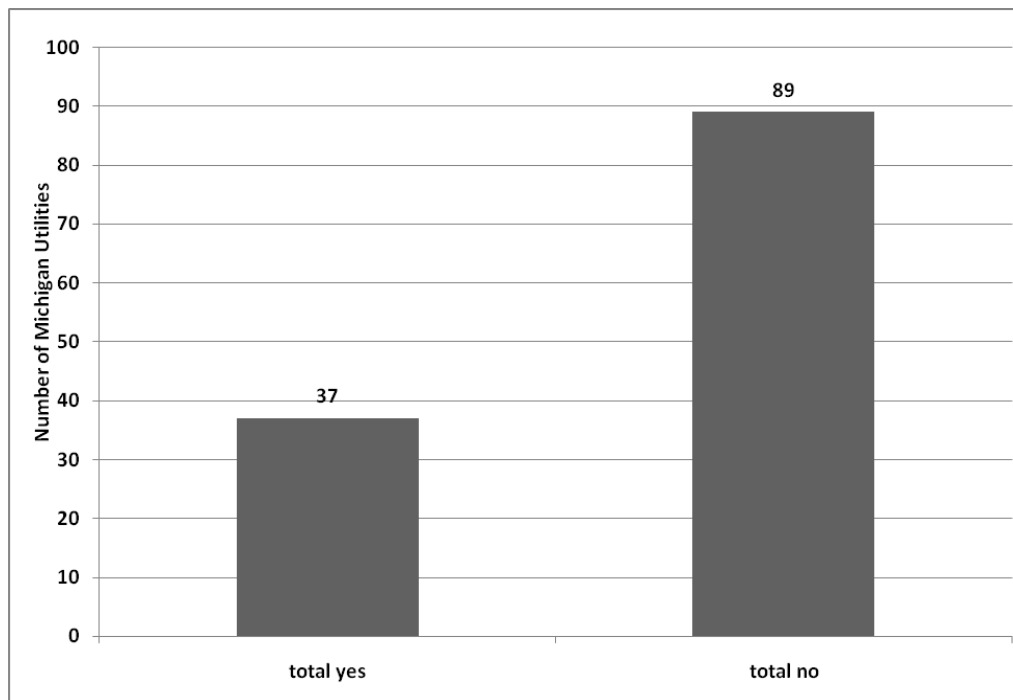
Figure 2-5: Security Project Costs Michigan Water Utilities



2.4.2 WARN Program

The third topic of the survey concerned utilities' interest in the newly formed Michigan WARN program. An affirmative response indicating planned participation was received by 37 utilities (Figure 2-6). The remainder responded that they would not participate primarily because of lack of familiarity with the program.

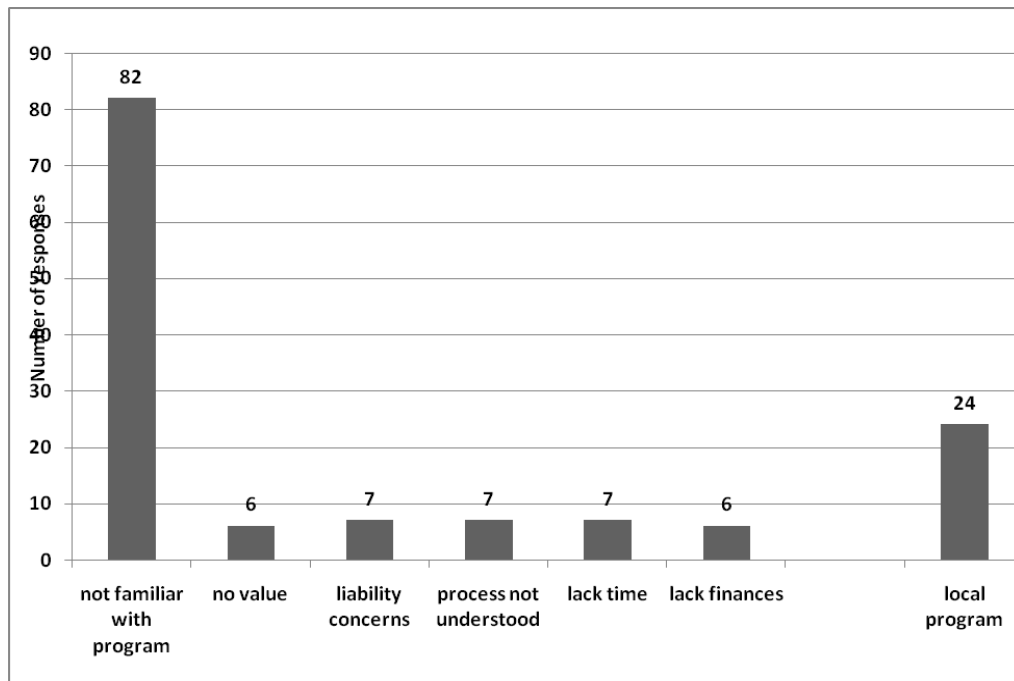
Figure 2-6: Plan to Participate in WARN Program



During the course of the survey, this question was modified to determine first if utilities knew of the WARN program and then second to determine if they would participate. It became clear that lack of familiarity was the primary reason for the negative responses. When the program was explained to utilities, affirmative interest was received from most. Concerns over time, finances and liability were reported but infrequent (Figure 2-7).

Interestingly, a number of utilities reported that they already had a similar program on a local level. These programs might be with Police and Fire but were also reported with other local utilities. Most of these local programs were informal with no official agreements. Instances of equipment sharing were reported. In one example, several local utilities were all wired the same to share an emergency generator. One group of communities reported a program dating back to 1979. In one case, when a recent tornado caused damage, neighboring communities provided assistance. A number of interconnections were reported to address water outages.

Figure 2-7: Frequency of Reasons for Non-Participation in WARN



2.5 Conclusions

A total of 216 utilities were contacted to request participation in this project. Of these, 61 percent participated in the phase two survey.

From the data collected, it is apparent that utilities are continuing to provide ongoing security projects to enhance their system. One utility commented that “security projects are just a routine part of the budget, like chemicals.” A focus on physical restrictions and detection were favored by most utilities. Fencing and camera/video monitoring were the most frequently cited projects. Projects ranged from simple locks to sophisticated distribution system water quality monitoring systems. Utilities that are investing in security improvements are typically spending about \$375,000 per year and budgeting approximately the same for future projects. Some utilities reported integrating security into routine utility functions.

Utilities were also surveyed regarding knowledge of and willingness to participate in the Michigan WARN program. An affirmative response was received by 37 utilities. The remainder responded that they would not participate, primarily because of a lack of familiarity with the program. When the program was explained, a high level of interest was indicated. Therefore, education and publication regarding the program will be essential to its success. A number of utilities reported that they already had a similar program on a local level. These programs might be with Police and Fire but were also reported with other local utilities. Most of these local programs were informal with no official agreements. Instances of sharing of equipment were reported.

Section 3: Phase 3

3.1 Phase 3 Project Goal

The third phase of the VA-CIP project shifted the focus of the project from assessment of physical infrastructure security improvements to emergency program management. In this last phase of the project, utilities were surveyed regarding their performance and needs for emergency planning, documentation and practice. The survey sought to document existing conditions as well as identify opportunities for enhancement.

Data for this phase were collected during August 1, 2008 to December 22, 2008.

3.2 Data Collection Procedures

All utilities participating in Phase 2 of this project were asked to participate in Phase 3. Since these utilities had previously cooperated in the research effort, a high level of participation was predicted. Five Phase 2 utilities were dropped from the list, as they had not supplied any identifiable contact information in their Phase 2 response. Therefore, a total of 125 utilities were contacted, and responses were received from 102.

Of responses received, utilities were scattered throughout the state and represented different sizes of populations served (Table 3-1). Phase 3 achieved good coverage of utilities, which is similar to the representative distribution within the state and comparable to the distribution in Phases 1 and 2.

Table 3-1: Population Served by Participating Utilities		
Population Served	Number of Utilities Responding to the Survey	Percent of Utilities Completing the Survey
1 – 5,000	26	25%
5,001 – 10,000	28	27%
10,001 – 50,000	34	33%
50,001 – 100,000	8	8%
>100,001	3	3%
Utility not identified	3	3%

All utilities were allotted three contacts to solicit participation. The first contact was conducted via e-mail if it was available. Eighty-six utilities had e-mail addresses and were contacted initially via this method. Utilities that did not respond to the e-mail contact or who did not have an e-mail address were contacted by telephone. Two phone calls were made to all utilities either as a follow-up contact to e-mail or as an initial contact. If utilities did not have an e-mail address and did not respond to phone calls, then a hard copy of the survey was mailed to them. In summary, all utilities received up to one hard or e-mail copy and two phone attempts to solicit response. A

letter describing the project, requesting participation and reporting on the results was sent by the MDEQ to utilities (Appendix E) accompanied by a copy of the survey (Appendix F).

All information was treated as confidential. All utilities were assigned a unique identifier.

The data received from the utilities was captured on a hard copy form and then entered into an Excel spreadsheet for data analysis. An additional Word file was developed for comments not adequately captured in the database.

3.3 Response Rate

The VA-CIP project Phase 1 database consisted of 293 water utilities in the State of Michigan. Phase 1 of the project consisted of site visits to assess implementation of security projects identified in the vulnerability assessments. A total of 216 (74 percent) of the utilities participated in this phase.

Phase 2 of the VA-CIP project assessed the ongoing commitment to security-based project implementation and future funding needs. A total of 130 utilities participated in this phase. This response rate is 44 percent of the original database (293 utilities) and 61 percent of the Phase 1 respondents (216 utilities). Only one utility refused to participate in Phase 2 that had participated in Phase 1. Other non-participants were unresponsive or unidentifiable (anonymous response).

Phase 3 of the VA-CIP project concerned emergency management documentation, practices and procedures. A total of 102 utilities participated in this phase. This response rate is 35 percent of the original utility set (293 utilities) and 78 percent of the Phase 2 participants (130 utilities). Non-participants were either unresponsive or unidentifiable (anonymous response).

Table 3-2: Utility Participation and Retention Rates in All Phases of VA-CIP Project			
	Number of Participating Utilities (out of 283)	Response Rate (percent of 283 utility database)	Retention Rate (percent participation from prior phase)
Phase 1	216	74%	
Phase 2	130	45%	60%
Phase 3	102	35%	78%

3.4 Results

3.4.1 Documentation of Security Practices

Utilities were surveyed regarding their documentation of emergency action/response plans (ERPs). Some utilities referred to these as contingency plans; this was clarified and accepted as a substitute for the responses to these questions. MDEQ has proposed

regulations that will replace the outdated contingency plan with ERP terminology and protocols.

Utility personnel did not always clearly understand what constituted an ERP scenario. Several people responded concerning their safety training, such as confined-space entry. Others responded regarding main breaks and repairs. In these cases, the question was clarified by the interviewer. If the answers did not meet the ERP criteria, the responses were noted but not collated in the database.

Fifty-six percent of utilities updated their emergency plans annually (Figure 3-1 for percentage & Table 3-3 for number). This update included everything from a simple review of contact information to the addition of new emergency scenarios and response plans. However, these utilities were reviewing their plans to some degree every year. Thirty-eight percent of utilities updated their plans less frequently than annually, ranging from every two to every 10 years. Five percent updated plans more frequently than annually, ranging from every two to every 10 years. Five percent updated plans more frequently than annually. One utility commented that such updates needed to be continual, as information could change at any time.

Figure 3-1: Frequency that Utilities Update Emergency Response Plans (Percent)

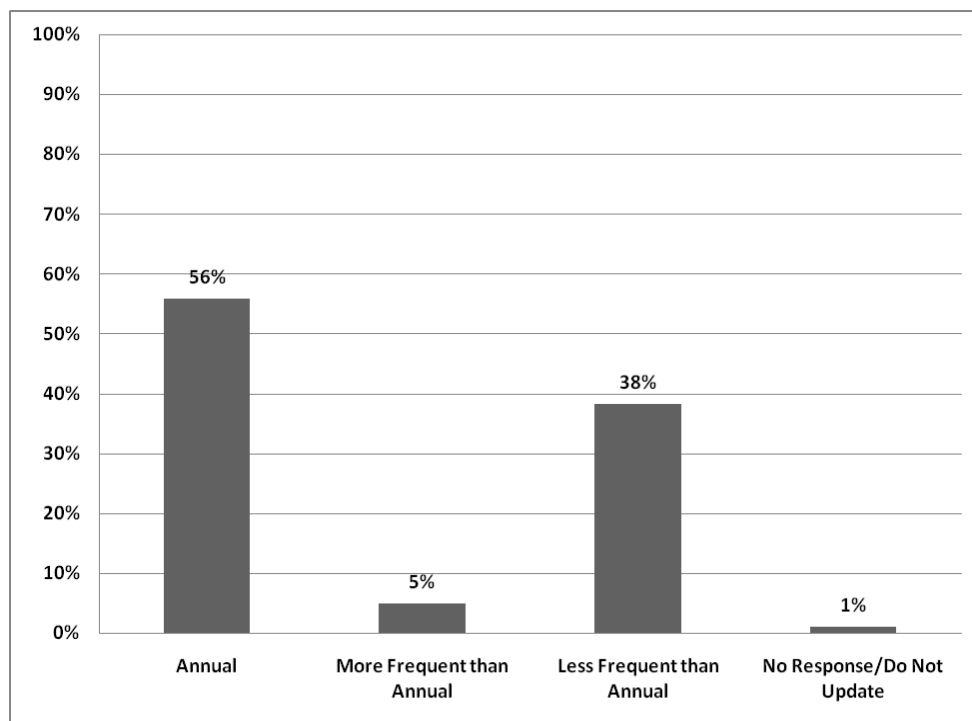


Table 3-3: Frequency that Utilities Update Emergency Response Plans (Number)				
	Annual	More Frequent than Annual	Less Frequent than Annual	No Response/Do Not Update
Number of Utilities	57	5	39	1

Eighty-two percent of utilities did not have a separate consequence management plan (CMP) from their emergency response plan, and 3 percent were unsure (Figure 3-2 for percentage & Table 3-4 for number). Most of these utilities were unaware of what constituted a CMP or requirements for it. Only 15 percent reported they had a CMP.

Figure 3-2: Percent of Utilities with a Consequence Management Plan

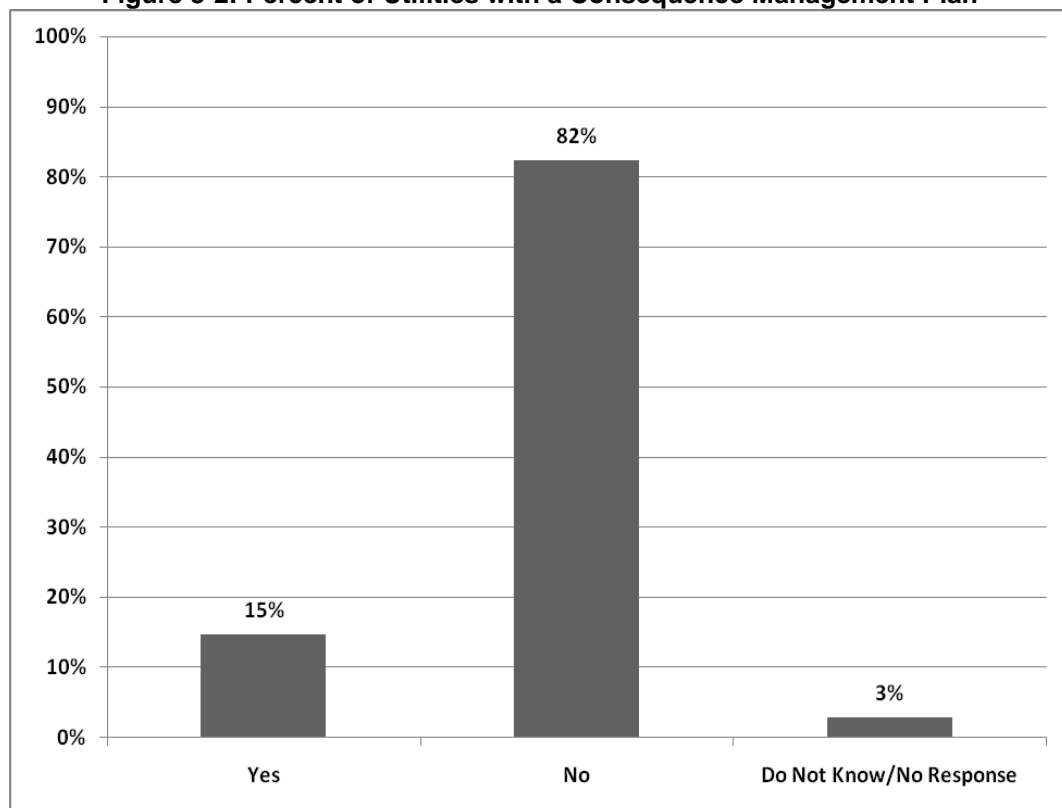


Table 3-4: Number of Utilities with a Consequence Management Plan			
	Yes	No	Do Not Know/No Response
Number of Utilities	15	84	3

Common problems with updating ERPs were solicited in the survey. Twenty-nine percent of utilities reported no problems with updating their plans (Figure 3-3 for percentage & Table 3-5 for number). Twenty-seven percent stated that obtaining and maintaining current correct contact information was a challenge. Nineteen percent reported that the time available to do the update was limited. Only 4 percent felt that cost was an issue. Twenty-one percent faced other challenges, including such items as coordination with others, changes in staff, could not find the document, determining who was in charge, never used the plan so not sure if it is effective, getting others to review, determining what to include, developing scenarios, cooperation/attitude, having correct distribution system information, internal coordination when shared responsibility, no alternative water supply available and software problems.

Figure 3-3: Frequency of Reported Problems with Updating ERPs

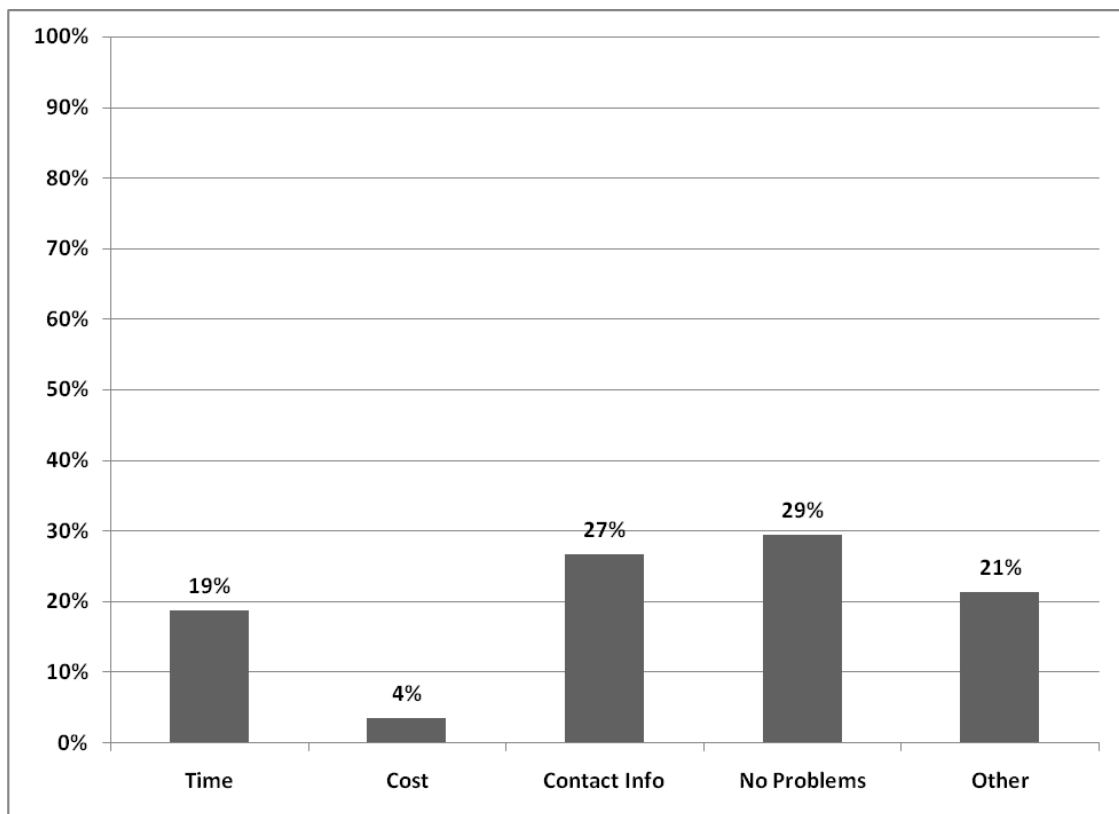


Table 3-5: Number of Responses for Common Utility Problems with Updating ERPs

	Time	Cost	Contact Info	No Problems	Other
Number of Utilities	21	4	30	33	24

Utilities were surveyed to assess what scenarios they covered in their emergency action plans. This question consisted of both a pre-established list of probable

scenarios as well as an open-ended question on other possibilities. Of the pre-set list, around 80 percent of utilities had plans for natural disasters, alternative water supply, distribution system contamination and power outage (Figure 3-4 for percentage and Table 3-6 for number). Only 41 percent had plans for treatment failures. However, this percentage would be predicted lower since not all plants had treatment. Some noted that this choice was not relevant for this reason. Thirty-five percent of utilities had other scenarios addressed in their ERPs. These scenarios included terrorist attacks, hazardous materials handling/spills, structural damage, cyber threats, microbial threats, loss of water pressure, disgruntled employees, list of water haulers, chemical spills, gas chlorine release, intrusion, flu pandemic, partnering with other agencies, death trains (hazardous materials spills), water storage, bombs, suspicious packages, nuclear incident, and source water contamination (algal blooms and alewives).

Figure 3-4: Frequency of Different Scenarios Addressed by ERPs

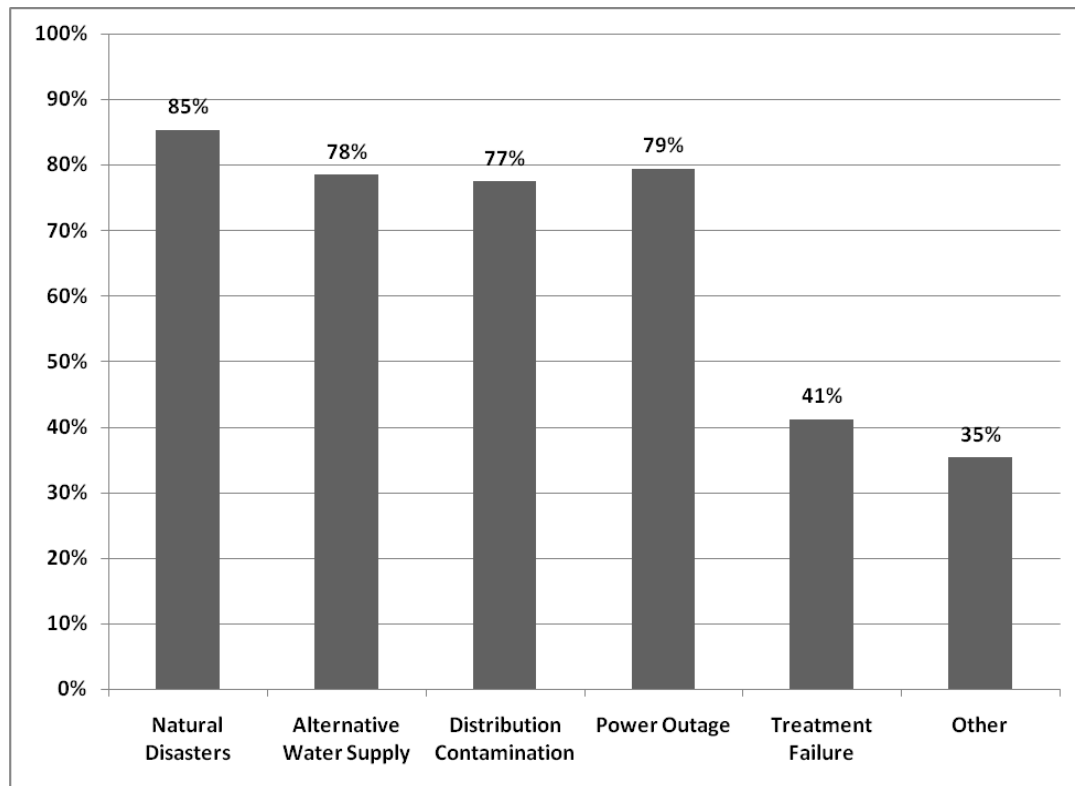


Table 3-6: Number of Scenarios Addressed in Utility ERPs

	Natural Disasters	Alternative Water Supply	Distribution Contaminations	Power Outage	Treatment Failure	Other
Number of Utilities	87	80	79	71	42	36

Utilities were surveyed on their development of prepared messages for dissemination to the public. Eighty-nine percent of utilities responded that they had a ready-to-go message for a “Boil water” notice. Forty-eight and 39 percent, respectively, had notices for “Do not drink” and “Do not use” the water (Figure 3-5 for percentage and Table 3-7 for number).

Figure 3-5: Percent of Utilities with Prepared Emergency Messages on Water Use

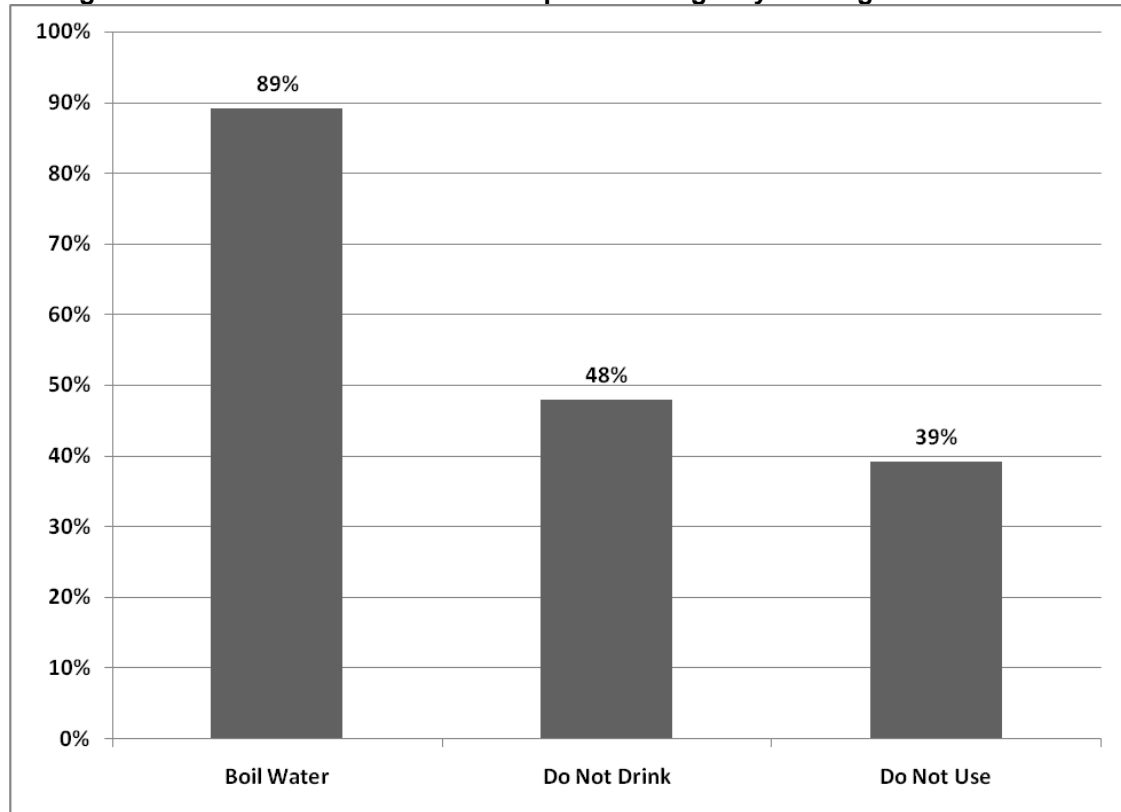


Table 3-7: Number of Utilities with Prepared Emergency Messages on Water Use

	Boil Water	Do Not Drink	Do Not Use
Number of Utilities	91	49	40

It was noted during this series of questions in particular that a number of utilities became interested in expanding their scenarios, messages and updating plans. The conversation initiated new ideas and increased motivation for enhancing their ERP program.

3.4.2 Tabletop & Full-scale Exercises

Just less than half of the utilities reported that they perform tabletop exercises of some frequency (Figure 3-6 for percentage and Table 3-8 for number). Frequency varied most commonly between one to five years. Some utilities had only performed one

exercise ever. One utility felt they did this monthly. More than half of the utilities have never conducted tabletop exercises.

Seventy-five percent of utilities had never been involved in a full-scale exercise. Of those that had participated in such events, it was infrequent and sporadic. Numerous utilities noted that another entity was responsible for full-scale exercises, such as police, fire or county organizations. Therefore, their role, if any, was minor.

Figure 3-6: Utility Frequency of Involvement in Tabletop and Full-scale Exercises to Address Emergency Scenarios

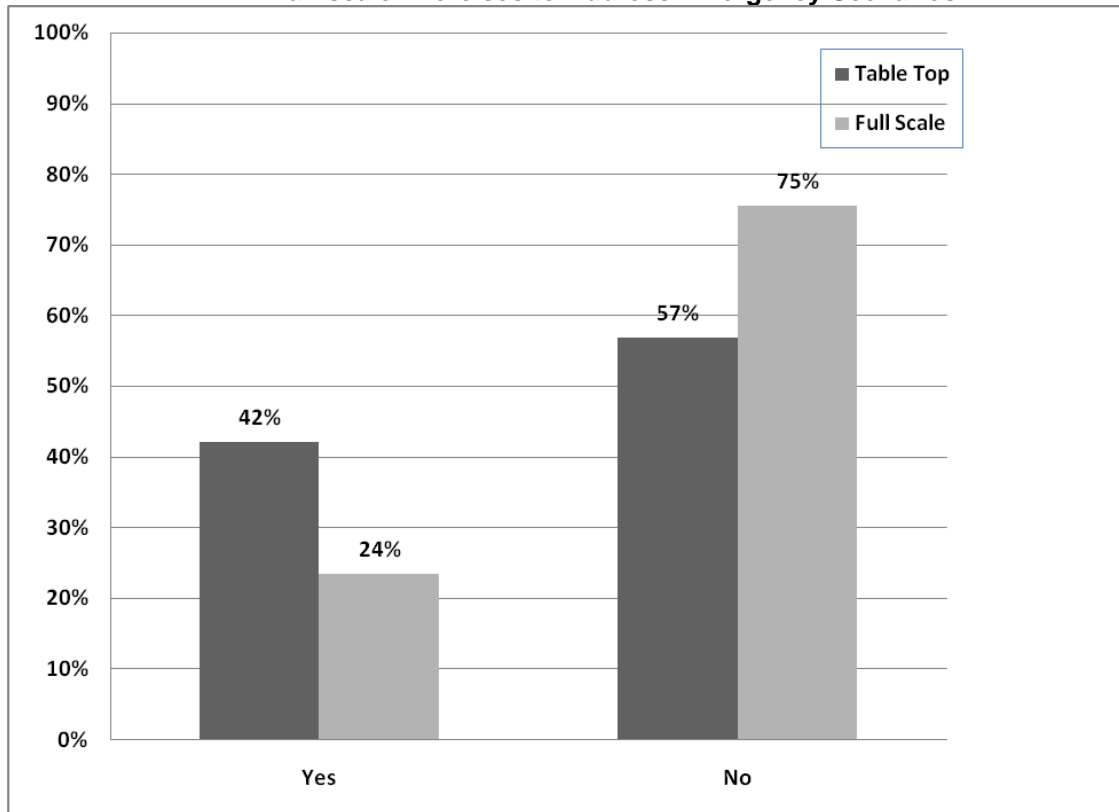


Table 3-8: Number of Utilities Involved in Tabletop and Full-scale Exercises to Address Emergency Scenarios

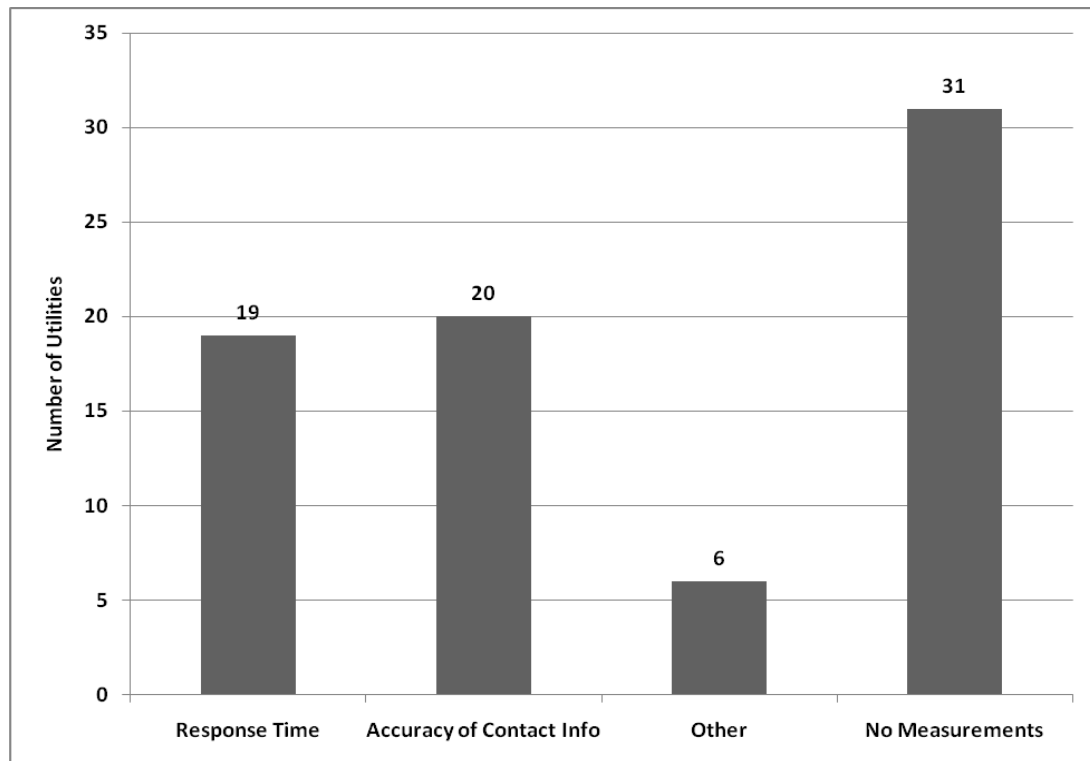
Utility Involvement?	Tabletop Exercises	Full-scale Exercises
Yes	43	24
No	25	77

3.4.3 Performance Metrics

Given the relatively low participation in tabletop and full-scale exercises, any analysis of performance metric response patterns should be treated with care. Of the utilities that practiced some frequency of emergency exercises, almost none had any true performance measures (Figure 3-7 for percentage and Table 3-9 for number). Most

utilities simply gathered informal feedback from participants. Some utilities reported that they used response time or accuracy of contact information.

Figure 3-7: Number of Utilities with Assessment of Exercises for Emergency Scenarios



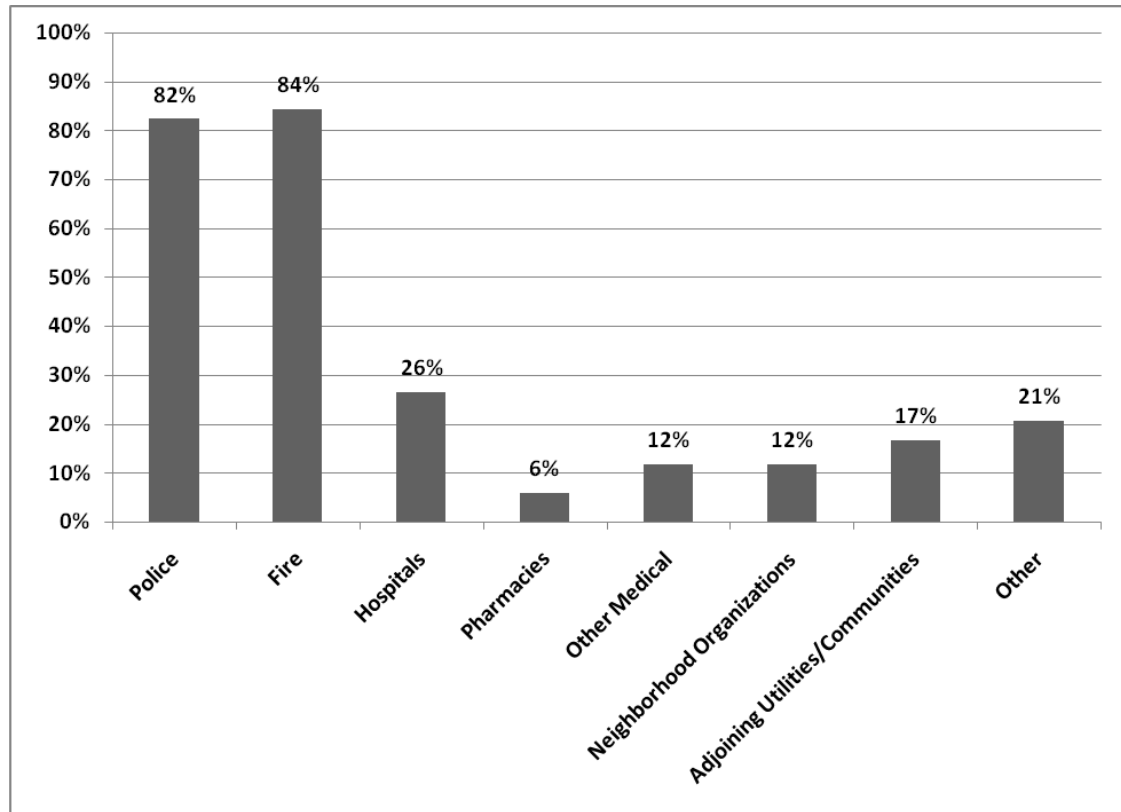
3.4.4 Relationships with other Emergency Responders

The question regarding the existence of formal relationships and agreements with other organizations was not clearly understood by many utilities. Numerous answers discussed informal rather than formal arrangements. Being part of the same organization was generally treated as a formal arrangement or agreement. In many cases, it was clear that the utilities were not the units that make or participate in these sorts of agreements; the formality occurs at a higher management level or is handled by a County or other Local Emergency Planning Commission (LEPC). Many utilities were unaware if they had relationships with other entities, particularly with the medical profession. Results from this question should be interpreted with the same caution as the performance metrics. Rates for formal agreements or relationships are likely overestimated because of the confusion of informal with formal arrangements.

Agreements with area police and fire departments were common, occurring with more than 80 percent of utilities (Figure 3-8 for percentage and Table 3-9 for number). The next most common interactions were with hospitals (26 percent) and adjoining communities (17 percent). Other agreements noted were with a school system for equipment storage, LEPCs, TV & radio, schools in general, milk hauler, the

Department of Public Works (DPW), state police, hydroelectric plant, labs, ham operator, coast guard, military base, nursing home, senior group, sheriff, county, road commission, sanitary district, bottled water supplier and health department.

Figure 3-8: Percent of Utilities with Formal Agreements or Interactions with Other Organizations for Emergency Response



	Police	Fire	Hospitals	Pharmacies	Other Medical	Neighborhood Programs	Adjoining communities	Other
Number of Utilities	84	86	27	6	12	12	17	21

3.4.5 Emergency Action Plan Training

Forty-three percent of utilities provide annual training on ERPs. Twenty-eight percent provide training on a different schedule, varying from more frequent (monthly) to less frequent (as needed). Some noted that such training is routinely provided for new employees. Eight percent of utilities either did not respond or did not know if/how frequently such training was conducted, while 20 percent provided no training (Figure 3-9 for percentages and Table 3-10 for number).

Figure 3-9: Frequency of Utility Personnel Training on ERPs

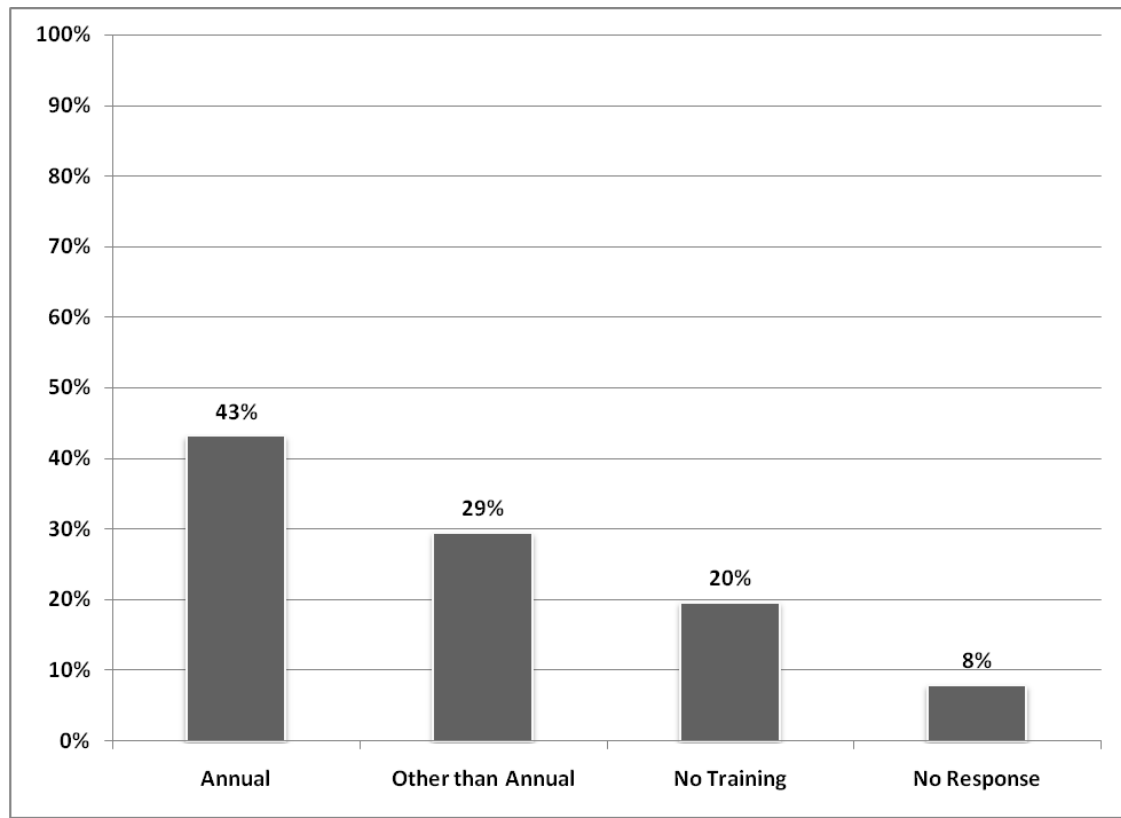


Table 3-10: Number of Utilities with ERP Training Frequencies

	Annual	Training Offered but More or Less than Annual	No Training	No Response
Number of Utilities	44	30	20	8

Some utilities were unfamiliar with NIMS. More than half of utilities had at least one person trained on NIMS (Figure 3-10 for percentages and Table 3-11 for number). The number of people trained varied widely from one to all water personnel. Forty percent of utilities had no one trained on NIMS. Eight percent either did not respond or did not know if anyone was trained. Quite a few utilities noted that NIMS training was held for others in their organization, such as police, fire and management. However, this training was not provided for their position or staff.

Figure 3-10: Percent of Utilities with at Least One Staff Person Trained in NIMS

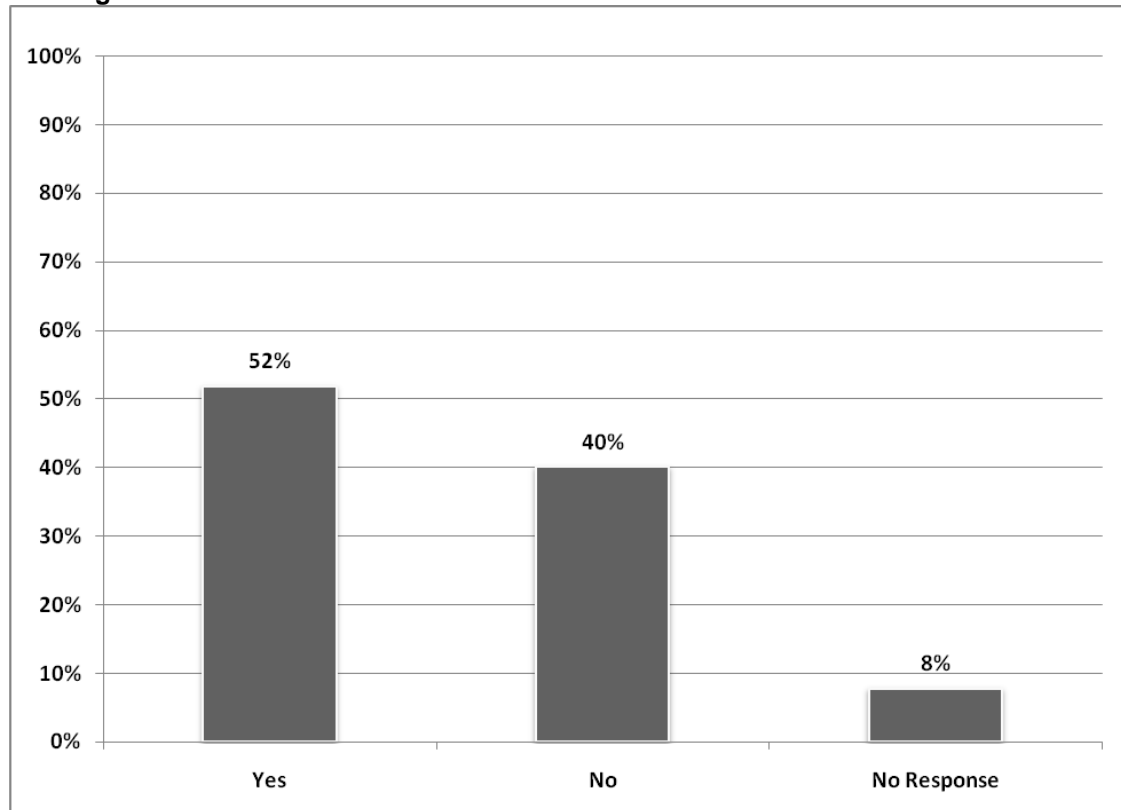


Table 3-11: Number of Utility Staff Trained in NIMS

	Yes	No	No Response
Number of Utilities	53	41	8

3.4.6 Emergency Response Planning Challenges

All utilities were asked to identify their biggest challenge in emergency response planning and execution. A wide range of answers were received. Some participants provided multiple answers. The challenges reported were:

- None (three responses)
- Lack of time (35 responses)
- Lack of personnel availability (11 responses)
- Communication, both internal and external (10 responses)
- Lack of funding (eight responses)
- Coordination with others (four responses)

Other individual challenges reported were:

- Being in a prepared state all the time

- Not get lax
- Being a small town, dealing with a potential large scale scenario might introduce logistical issues
- Remembering where and what to do; finding plan among so many different plans
- Keeping up to date and making sure everyone knows what to do
- During power loss, different department fixed it
- Making sure everyone is properly trained
- Creating community-wide perception of need for ERP
- Obtaining management and employee buy-in
- Redundant laws and non-funded mandates
- Cooperation and attitude
- Lack of training resources; federal government interference
- Keeping plan up to date, never used so not evaluated
- Need ideas for planning scenarios
- Predicting what could happen
- Equipment maintained and functional
- Lack of experience with real situation – who takes control?
- Getting people to take it seriously
- Availability of alternative water supply
- Handling regulations
- Making sure everyone makes it a priority
- Time and budget now that in charge of both WTP & WWTP
- Immediate assembly of public works resources – getting same response time as police and fire
- Isolating the problem – containing the water in a timely fashion
- Having proper documentation that it was completed
- In terms of execution, keeping people from tampering with fire hydrants
- Trying to make the public understand the situation and have them abide by the given warnings
- Getting another water source and maintaining water pressure
- Managing scenario where no water available for fire suppression system
- How to justify dollars when no real or perceived incidents
- Managing scenario of no power for a long time
- Determining rank of control and power with so many people involved in the county: "too many chiefs"
- Acquiring parts or service in a timely manner (small rural community)
- Difficult to make emergency response planning an immediate priority with other things going on

The common occurrence of time constraints is consistent with the first question from this survey. Time, personnel and funding account for many of the primary challenges facing the water profession, including the ability to perform emergency response planning and execution.

3.4.7 Future Needs

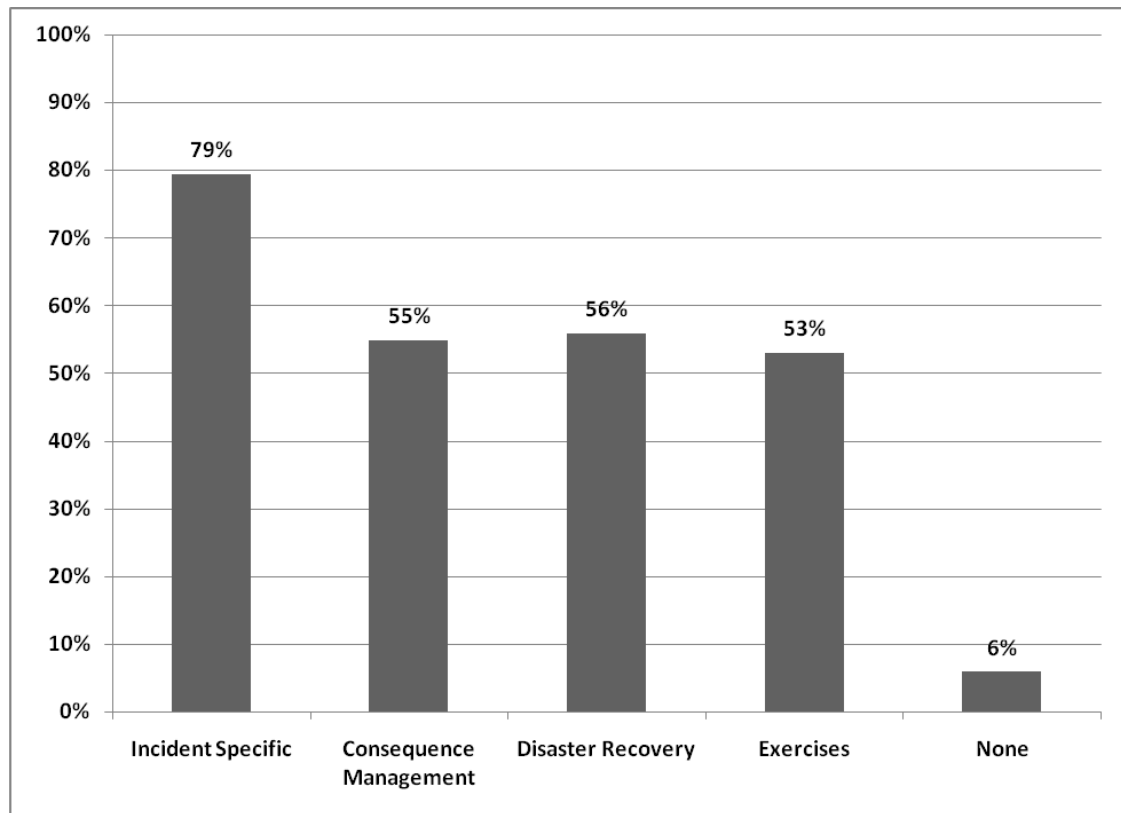
The final question assessed utilities' interest and need for some forms of assistance. The potential assistance was:

- a. Template for a relatively user-friendly incident-specific ERP that could easily be customized.
- b. Template for a consequence management plan based on the EPA designations for a possible, credible or confirmed event.
- c. Template for a disaster recovery plan that focuses on our critical mission and functions.
- d. Support in conducting tabletop or live exercises.

Utilities could select as many of the above as they felt appropriate. Utilities were requested to answer "yes" or "no." However, in a few instances, the answer received was "maybe." This was recorded in the spreadsheet to indicate potential interest. Only four utilities were not interested in any of the options. Seventy-nine percent of the utilities expressed interest in an incident specific template that could be customized for their utility. Between 50 and 60 percent were interested in a template for consequence management, a template for disaster recovery plans and/or assistance with tabletop/live exercises (Figure 3-11 for percentages & Table 3-12 for number). Selection of one option did not correlate with selection of other options.

Table 3-12: Number of Utilities Interested in Templates					
	Incident Specific	Consequence Management	Disaster Recovery	Assistance with Exercised	None
Number of Utilities	81	56	57	54	6

Figure 3-11: Percent of Utilities Interested in Assistance with Emergency Management Templates or Exercises



3.5 Conclusions

Most utilities are updating their ERPs with some frequency, although that frequency varies. The updates are most likely to be annual or less frequent. Almost one third of utilities reported no problems with updating their ERPs. However, this response may reflect the infrequent attempt to update rather than the actual revision issues. Almost half of the utilities reported issues with accuracy and ability to obtain good, current contact information and with allocating sufficient time to perform the updates. Utilities had many plans for many common emergency scenarios, including natural disasters, alternative water supplies, distribution system contamination and power outages. Many other scenarios were addressed by individual utilities, such as flu pandemics and chlorine gas releases. The diversity of plans available is extensive and provides an untapped resource for identifying potential new scenarios for other utilities. This resource could be prioritized and used to develop recommendations for utilities to consider in their emergency planning. Most utilities had ready-to-use prepared messages to notify the public of the need to boil water. Less than half the utilities had prepared messages on “do not use” and “do not drink” the water. Criteria and encouragement for this template preparation would be useful. Utilities were generally confused regarding the requirement and content of a consequence management. Few of these plans existed, and the majority of utilities did not know what this was.

Less than half the utilities had ever performed tabletop emergency scenario exercises. Only one quarter of the utilities had ever participated in a full-scale exercise. Full-scale exercises were often anecdotally reported as being handled by other organizations, so utilities were often not involved. Very few utilities had any approach for measuring success of either type of exercise. There is clearly a lack of practice and assessment regarding emergency exercises that creates a gap for utilities.

Most utilities have agreements and interactions with Police and Fire on emergency response planning. About one-quarter of utilities had some connection with local hospitals. Other relationships were found sporadically. There is opportunity to build on utility experience with diverse relationships and to provide templates and training to other utilities.

Most utilities provide some routine training on ERPs, with almost half performing this annually. However, more than one-quarter never provided training. Even higher rates for lack of training occurred for NIMS, including utilities that were unfamiliar with the program. These are important gaps that need to be addressed. Since NIMS training has been offered and advertized in the state, it is unclear why utilities have not availed themselves of this knowledge and opportunity.

Time, personnel and funding account for many of the primary challenges facing the water profession, including the ability to perform emergency response planning and execution. The MDEQ may wish to look at ways to provide support to utilities for emergency response planning and execution, such as through grants or other assistance. Most utilities indicated an interest in user-friendly customizable templates for incident specific ERPs. More than half were interested in additional templates or assistance with exercises. Such activities would be beneficial to the overall emergency response preparedness.

Overall, a high response rate was received from utilities. Thirty-four percent of the original Phase 1 database completed both Phases 2 and 3. These are clearly highly motivated utilities. It is possible that the responses received in the Phase 3 survey represent the more involved utilities that have made emergency planning a priority. If true, this may skew the reported frequencies to be higher than that occurring industry wide.

Individual comments from utilities that were not captured in the database are provided in Appendix G.

Section 4: Recommendations

In summary, Michigan utilities have been responsive to increased security concerns and have taken a variety of actions to increase the security of their facilities. The utilities are continuing to address and implement security enhancements. The following recommendations will help enhance Michigan water utility emergency management and security project implementation.

1. Educate utilities on the availability and benefits of the WARN program.
2. Support funding opportunities for implementation of water utility security improvements; train utilities on obtaining grants for security projects.
3. MDEQ should encourage utilities to establish annual ERP updates.
4. Provide more training for MDEQ and utility staff on Emergency Response Planning.
5. Combine the ERP with the CMP. This would provide “one-stop-shopping” and would be simpler to maintain and review. This should be accompanied by a provision, through e-mail, conference or training programs, of the CMP requirements as most utilities were unfamiliar with this program.
6. Provide a venue for utilities to share ERP scenarios. While most utilities had a good base of ERP scenarios, the list of additional ones developed by different utilities was extensive. The ability to share these ideas would benefit the industry.
7. Develop and have MDEQ staff disseminate templates and criteria for “Do not use” and “Do not drink” the water.
8. Provide assistance with table top exercises. Develop performance metrics for exercises and provide training in their use.
9. Formalize a process for NIMS training and educate utilities, city managers and local elected officials on its value and availability.
10. Develop a recommended list of organizations for formal agreements inter-organizational agreements. Develop templates and provide case studies on how to develop and use interactions, such as with the medical community.
11. Develop and prioritize tools to assist the utilities, such as ready-made templates or exercises that reduce utility time requirements.
12. Develop templates for plans that a utility can easily customize (incident specific, consequence management and disaster recovery).

Appendix A: Letter from MDEQ to Utilities



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

TO: Public Water Systems That Completed Security Vulnerability Assessment

FROM: James K. Cleland, Chief, Lansing Operations Division, Water Bureau

DATE: October 20, 2006

SUBJECT: CDM Michigan Inc. (CDM) Selected for Public Water Systems' (PWS) Vulnerability Assessment (VA) Capital Improvement Program (CIP) Follow-Up

Contractor

CDM has been selected as the contractor to assist the Water Bureau of the Department of Environmental Quality (DEQ) in implementing the PWS security program in Michigan over the next two years.

Purpose

The purpose of the VA CIP follow-up is to improve PWS security by implementing changes identified in the individual PWS's VA. The VA CIP follow-up contract is intended to assist the PWS in the implementation of their VA CIP and improve water security in the state.

The VA CIP follow-up contract is not a compliance assessment. All Michigan communities that were required to complete a VA complied with the Bioterrorism Act of 2002 (Act). Those PWS are being asked to participate in this program in order to determine the status of the PWS's security program and allow the state to better direct future efforts and grant funding opportunities.

Background/History

The Act, which amended the federal Safe Drinking Water Act, required 288 PWS in Michigan that serve a population greater than 3,300 to complete a VA of the security of their PWS. This contract is funded by the United States Environmental Protection Agency (USEPA) water sector security grant.

Contract

Staff from the DEQ, Water Bureau, and CDM will collect information on the implementation of capital improvements identified in the PWS VA as was required by the Act. As agreed to by the PWS in preliminary telephone contact, all PWS wishing to participate will be visited by CDM and DEQ staff. In addition to the facility site visit, all PWS will be contacted by CDM by telephone over the next two years to determine if there have been any additional updates to the initial site visit.

SUBJECT: CDM Michigan Inc.
Page 2
October 20, 2006

Information Security

Your PWS will be assigned a random number specifically for this project, and information gathered in the VA CIP follow-up will be generic in nature. Inasmuch as the VA is a secured document with your PWS and the USEPA headquarters, no VAs or copies thereof will be obtained during the site visit. No facility-specific capital improvements will be identified. Attachment A is an excerpt from the Michigan Freedom of Information Act, 1976 PA 442, as amended, which states that PWS designs and threat assessments are not subject to disclosure.

Schedule

CDM and their contract partners from Michigan Rural Water Association are scheduled to assist the DEQ and the 288 PWSs in implementing their water security improvements by performing site visits for all eligible PWS by September 30, 2007. Site visit schedules will be developed and coordinated with the PWS and DEQ district offices in the upcoming months.

Reports

Contract activities will be reported during the contract as well as upon the completion of the contract and will include the following:

- Number of VAs
- Number of facility site visits, date, and attendance list by position
- Number of CIP items identified by VAs
- Number of CIP items completed
- Number of CIP items remaining
- Percent of CIP items completed
- Percent of CIP items remaining
- Number of CIP items that, subsequent to VA completion, have been identified for security and have been completed

Inasmuch as this contract was just initiated on September 15, 2006, CDM is currently developing the details of VA CIP follow-up contract and more specific information will be sent out as it becomes available. You may elect to participate upon being contacted by CDM in the coming months regarding the VA CIP follow-up contract.

If you have any questions or comments, please feel free to contact Robert Babcock, Security and Emergency Response Coordinator, Lansing Operations Division, Water Bureau, at 517-373-8566 or babcockr@michigan.gov; or Barry Sarin, CDM, at 517-702-1213 or sarinb@cdm.com.

SUBJECT: CDM Michigan Inc.
Page 3
October 20, 2006

Further public water security information is available on the DEQ, Water Bureau's
Internet Web site at http://www.michigan.gov/deq/0,1607,7-135-3313_23413---,00.html .

Attachment

cc: Barry Sarin, CDM
Nick Damato, USEPA
Richard A. Powers, DEQ
Frank J. Baldwin, DEQ
Robert Babcock, DEQ
Water Bureau District Supervisors, DEQ

James K. Cleland

Attachment A: Excerpt from the Michigan Freedom of Information Act, 1976 PA 442,
as Amended

FREEDOM OF INFORMATION ACT (EXCERPT)
Act 442 of 1976

15.243 Exemptions from disclosure; public body as school district or public school academy; withholding of information required by law or in possession of executive office.

Sec. 13. (1) A public body may exempt from disclosure as a public record under this act any of the following:

(y) Records or information of measures designed to protect the security or safety of persons or property, whether public or private, including, but not limited to, building, public works, and **public water supply designs** (emphasis added) to the extent that those designs relate to the ongoing security measures of a public body, capabilities and plans for responding to a violation of the Michigan anti-terrorism act, chapter LXXXIII-A of the Michigan Penal Code, 1931 PA 328, MCL 750.543a to 750.543z, emergency response plans, risk planning documents, threat assessments, and domestic preparedness strategies, unless disclosure would not impair a public body's ability to protect the security or safety of persons or property or unless the public interest in disclosure outweighs the public interest in nondisclosure in the particular instance.

Appendix B: Phase 1 Survey

Security Enhancement Evaluation

System Number: _____

Evaluator: _____

Site Visit Date: _____

Contact Title: _____

Other Visit Attendee Titles:

1. How many and what types of projects were identified from your VA?

2. Have you completed any of the enhancements projects from the VA?

Yes_____ No_____

If yes, how many, what type are the security enhancements and the costs involved?

If no, can you elaborate on the reason(s) why they have not to date:

If no, do you have a schedule or timeline for completing the enhancements?

Yes_____ No_____

If yes, what is the schedule or timeline for the completing the enhancements?

3. Have you identified any additional enhancements projects after completion of the VA?

Yes____ No____

If yes, *how many, what type are the security enhancements, costs involved, and have any of these been implemented?*

If no, can you elaborate on the reason(s) why they have not to date:

4. Are there any changes in policies or procedures since you submitted your VA?

Yes____ No____

If yes, what are those changes?

5. Are there any changes with your emergency response plan since you submitted your VA?

Yes____ No____

If yes, what are those changes?

Comments:

Evaluator checklist:

Enhancements could include:

- Locks Motion sensors

- Lights Cameras

- Fences Alarms

Policy/procedure changes could include:

- Entry procedures Operational policies/procedures

- Personnel procedures Personnel policies

- Security check procedures Relationships with other departments

Notes:

Appendix C: Letter from MDEQ to Utilities



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

TO: Public Water Systems That Completed Security Vulnerability Assessment

FROM: Robert F. Babcock, Security and Emergency Response Coordinator
Water Bureau

DATE: December 10, 2007

SUBJECT: Phase II of Vulnerability Assessment (VA) Capital Improvement
Program (CIP) Follow-Up by CDM Michigan, Inc.

Phase II of the VA CIP Follow-Up

Thank you for your participation in Phase I of the VA CIP follow-up project and for implementation of your water security program. As a result of your participation in Phase I, your community, the Michigan Department of Environmental Quality (MDEQ), and the national public water supply (PWS) program are better able to demonstrate that water system security has been implemented and is continuing.

Phase II of the VA CIP project consists of follow-up to determine the status of your water system security program. Follow-up includes telephone calls/e-mails to determine new items you have identified and the status of those – completed and waiting for funding. Janice Skadsen of CDM Michigan, Inc., is the project manager for the VA CIP follow-up project and may be contacted at skadsenjm@cdm.com or 734-213-5444, Extension 22109.

Why Participate in Phase II of the VA CIP Follow-up?

Inasmuch as Phase I shows that the public water systems in Michigan have taken the water system security program seriously, it is useful to show the continued improvements that have taken place since the VA was completed. It's beneficial for the community to not only have completed their own projects that resulted from the VA, but also show the continuing security effort subsequent to the VA for new projects that have been identified and the status of implementation.

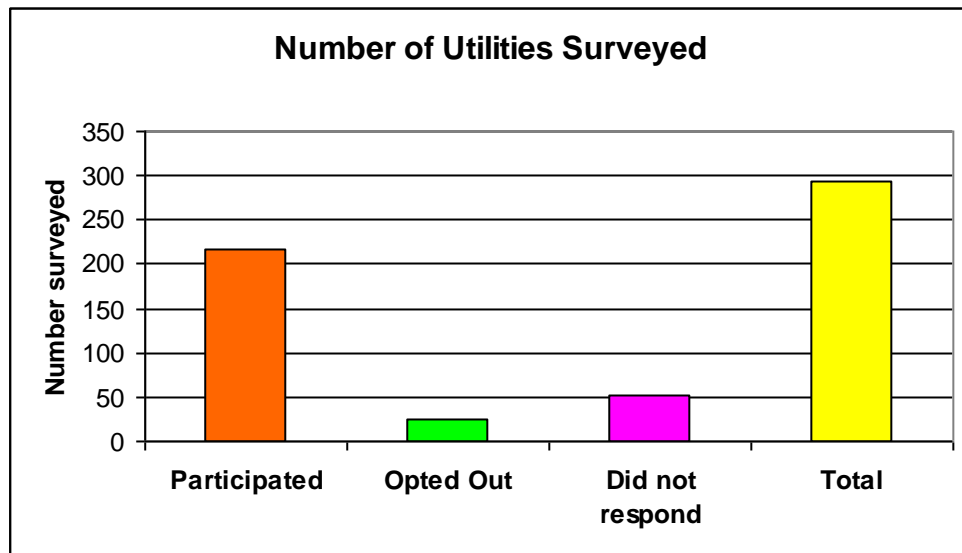
By way of background, the following is information from Phase I of the VA CIP follow-up:

Phase I Utility Response Rate

The initial list supplied by the MDEQ was reviewed and some additional contacts added. A total of 290 utilities were contacted. Of these, six were part of another system and participated as a single unit. Therefore, the final number of potential participants was

293 of which 216 (74 percent) participated in the study (Figure 1). Fifty-one (17 percent) facilities either did not respond or indicated that they would complete the survey but failed to deliver it on time. A total of 25 (9 percent) utilities declined to participate in the survey.

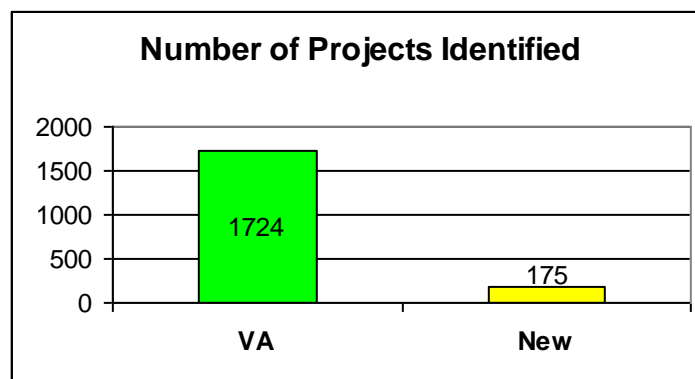
Figure 1: Rate of Utility Participation in Project Survey



Study Conclusions

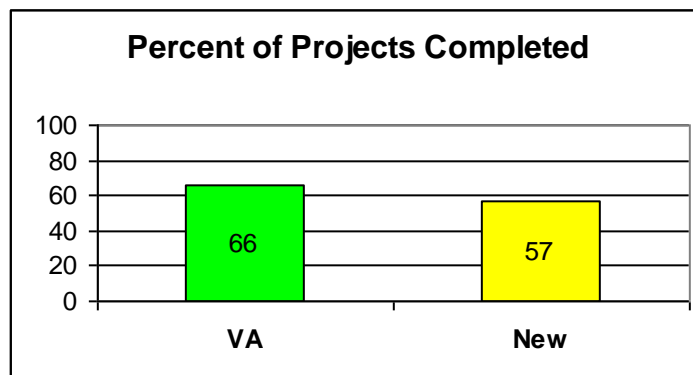
In Michigan, a total of 1,724 projects were identified in the VAs and 175 post-VA (Figure 2). Michigan water utilities identified a total of 1,899 security projects ranging from the addition of new locks to emergency generators.

Figure 2: Total Quantity of Security-Related Projects Identified by Michigan Water Utilities from 2002 to 2007



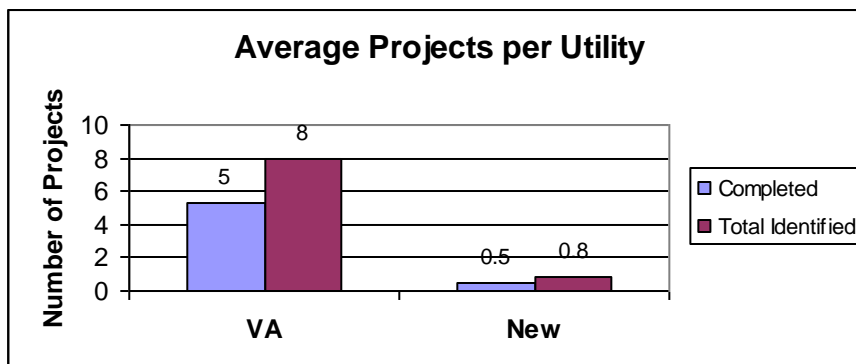
Of these projects, the majority have been completed. Sixty-six percent of the projects identified as part of the VAs have been done and 57 percent of security projects identified at a later date have been accomplished (Figure 3). The most common reasons for not completing projects included lack of funding, lack of staff time, and inability to implement the project (some utilities found that initial plans proved impractical or impossible to complete).

Figure 3: Completion Rate of Security Projects Identified by VA or Post-VA from 2002 to 2007



Therefore, a total of 1,244 security-based projects have been completed to enhance the security of water utilities in Michigan. The data collected indicate that Michigan utilities identified on average eight projects per utility from their VA and completed on average five projects per utility (Figure 4). The utilities continued to identify projects post-VA demonstrating a continued effort in security enhancements. On average, slightly less than one project per utility was identified and completed post-VA.

Figure 4: Average Number of Projects Identified and Completed per Michigan Utility Based on the VA Report and Post-VA



Typical projects included locks, fences, cameras, motion detectors, card key access, and emergency power generators. Project costs ranged from \$100 for new locks to \$5 million for new generators to supply power back-up. Almost all utilities modified their policies and procedures. In addition, many utilities updated their emergency response plans; however, this was often a routine update and not just driven by the VA.

In conclusion, Michigan utilities have been responsive to increased security concerns and have taken a variety of actions to increase the security of their facilities. The utilities are continuing to address and implement security enhancements.

Information Security

As with Phase I information, your PWS will be assigned a random number specifically for this project, and information gathered in the VA CIP follow-up will be generic in nature. No facility-specific capital improvements will be identified.

Schedule

Phase II is scheduled to be completed by December 31, 2008.

Reports

Contract activities will be reported during the contract as well as upon completion of the contract and will include the following:

- Number of VAs
- Number of facility site visits, date, and attendance list by position
- Number of CIP items identified by VAs
- Number of CIP items completed
- Number of CIP items remaining
- Percent of CIP items completed
- Percent of CIP items remaining
- Number of CIP items that, subsequent to VA completion, have been identified for security and have been completed

If you have any questions or comments, please feel free to contact Robert Babcock, Security and Emergency Response Coordinator, Lansing Operations Division, Water Bureau, MDEQ, at 517-373-8566 or babcockr@michigan.gov; or Janice Skadsen, CDM.

Further public water security information is available on the MDEQ, Water Bureau, Internet Web site at <http://www.michigan.gov/deqwater> (select Water and Wastewater Security from the list on the left).

Attachment

cc: Nick Damato, United States Environmental Protection Agency
James K. Cleland, Chief, Lansing Operations Division, Water Bureau, MDEQ
Water Bureau District Supervisors, MDEQ



Attachment A: Excerpt from the Michigan Freedom of Information Act, 1976 PA 442, as Amended

FREEDOM OF INFORMATION ACT (EXCERPT) Act 442 of 1976

15.243 Exemptions from disclosure; public body as school district or public school academy; withholding of information required by law or in possession of executive office.

Sec. 13. (1) A public body may exempt from disclosure as a public record under this act any of the following:

- (y) Records or information of measures designed to protect the security or safety of persons or property, whether public or private, including, but not limited to, building, public works, and **public water supply designs** (emphasis added) to the extent that those designs relate to the ongoing security measures of a public body, capabilities and plans for responding to a violation of the Michigan anti-terrorism act, chapter LXXXIII-A of the Michigan Penal Code, 1931 PA 328, MCL 750.543a to 750.543z, emergency response plans, risk planning documents, threat assessments, and domestic preparedness strategies, unless disclosure would not impair a public body's ability to protect the security or safety of persons or property or unless the public interest in disclosure outweighs the public interest in nondisclosure in the particular instance.

Appendix D: Survey

VA-CIP Project, Phase 2 Survey

Please answer the following three questions.

1. Has your utility completed any security related projects in 2007? YES
NO
 - If yes, please provide a brief description and estimated cost:
2. Has your utility identified or planned any new security related projects for 2008 or later? YES
NO
 - If yes, please provide a brief description, year project anticipated and estimated cost:
3. Does your utility intend to participate in the Michigan WARN program? YES
NO
 - If no, please indicate all of the reasons why not (circle your answers)
 - a. not familiar with program
 - b. do not see any value in program
 - c. concerned over liability issues
 - d. do not understand how works
 - e. do not have sufficient staff time
 - f. do not have sufficient finances
 - g. other, please list

For information on WARN, please go to http://www.michigan.gov/deq/0,1607,7-135-3313_23413-161032--,00.html

Thank-you for your participation.

Please return the survey by January 15, 2008 via email, fax, hard copy or phone to:

Janice Skadsen
3055 Miller Rd
Ann Arbor, MI 48103
734-213-5444 x 22109
734-213-5775 fax
skadsenjm@cdm.com

Appendix E: Letter from MDEQ Requesting Utility Participation in Phase 3



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

TO: Participating Public Water Systems

FROM: Robert F. Babcock, Security and Emergency Response Coordinator
Water Bureau

DATE: August 1, 2008

SUBJECT: Phase III of Vulnerability Assessment (VA) Capital Improvement
Program (CIP) Follow-Up by CDM Michigan, Inc.: Policies, Procedures,
and Practices of Your Security Program

Phase III of the VA CIP Follow-Up

Thank you for your participation in Phases I and II of the VA CIP follow-up project and for the implementation of your water security program. As a result of your participation in Phases I and II, your community, the Michigan Department of Environmental Quality (MDEQ), and the national public water supply programs are better able to demonstrate that water system security has been implemented and is continuing.

The last part, Phase III, of the VA CIP consists of follow-up to determine the status of policies, procedures, and practices or the 'soft side' of your water system security program. Just as the 'hard side' of the water security program (i.e., fences, locks, video cameras, and barriers) is important, the ever-changing 'soft side' is a part of the water security program.

Follow-up includes completion of the attached survey (Attachment A), and telephone calls/e-mails to determine the status of your policies, procedures, and practices. Janice Skadsen of CDM Michigan, Inc., is the project manager for the VA CIP follow-up project and may be contacted at skadsenjm@cdm.com or 734-205-2709.

Why Participate in Phase III of the VA CIP Follow-Up?

Inasmuch as Phases I and II show (below) that the public water systems in Michigan have taken the water system security program seriously, it is useful to show that the so-called 'soft side' of the water security program is also being implemented. Such things as policies, procedures, practices, plans, notices, exercises, and relationships have been and will continue to be a part of the water system security program. It's beneficial for the community to not only have completed their own projects that resulted from the VA, but also show the continuing security effort subsequent to the VA for the policies, procedures, and practices.

We very much appreciate your continued participation in this project. We are attaching the preliminary report from Phase II for your information (Attachment B).

CONSTITUTION HALL • 525 WEST ALLEGAN STREET • P.O. BOX 30273 • LANSING, MICHIGAN 48909-7773
www.michigan.gov • (517) 241-1300

SUBJECT: Phase III of VA CIP Follow-Up
Page 2
August 1, 2008

Information Security

As with Phases I and II information, your public water supply will be assigned a random number specifically for this project, and information gathered in the VA CIP follow-up will be generic in nature. No facility-specific capital improvements will be identified. As indicated in Attachment C, public water system information is protected under the Michigan Freedom of Information Act, 1976 PA 442, as amended.

Schedule

Phase III is scheduled to be completed by December 31, 2008.

Reports

A final project report will be prepared and shared with all participating utilities.

If you have any questions or comments, please feel free to contact me at 517-373-8566 or babcockr@michigan.gov; or Janice Skadsen, CDM, at skadsenjm@cdm.com.

Further public water security information is available on the MDEQ, Water Bureau, Web site at <http://www.michigan.gov/deqwater> (select Water and Wastewater Security from the list on the left).

Attachments

cc: Nick Damato, United States Environmental Protection Agency
James K. Cleland, Chief, Lansing Operations Division, Water Bureau, MDEQ
Water Bureau District Supervisors, MDEQ



Appendix F: Phase 3 Survey Form

VA-CIP Phase 3 Survey

1. Documentation

a. How frequently do you update your emergency response plans? (*please circle the most appropriate answer*)?

- i. Annually
- ii. More frequently than annual – please specify _____
- iii. Less frequent than annual – please specify _____

b. Do you have a separate consequence management plan? YES NO

c. What common problems do you encounter regarding updating of ERPs?

d. What scenarios do your ERPs address? (*please circle all that apply*)

- i. Natural disasters (fire, tornado, flood, other)
- ii. Alternative water supply
- iii. Contamination of distribution system
- iv. Power outage
- v. Failure of treatment process
- vi. Other(s) (please specify) _____

e. Which of the following messages do you have already prepared? (*please circle all that apply*)

- i. Boil water
- ii. Do not drink water
- iii. Do not use water

2. Exercises

a. How often do you perform table top exercises? _____

b. How often do you perform full scale exercises? _____

3. Performance metrics

- a. How do you assess the success of your table top or full scale exercises?

- b. What metrics to you use to measure effectiveness of the exercise? (*please circle all that apply*)

- i. response time
ii. accuracy of contact info
iii. other (please specify) _____
iv. do not have formal measurements

4. Relationships: Do you have agreements or formal interactions with (*please circle all that apply*):

- a. Police
b. Fire
c. Hospitals (emergency rooms)
d. Pharmacies
e. Other medical (please specify) _____
f. Neighborhood watch
g. Other (please specify) _____

5. Training

- a. How often do you provide staff training on ERPs? _____
b. How many of your staff have receiving training in NIMS? _____

6. Challenges

- a. What is your biggest challenge in emergency response planning and execution?

7. Which of the following would be most helpful in preparing for an emergency (*please circle all that apply*)

- a. Template for a relatively user-friendly incident-specific emergency response plan that could easily be customized
b. Template for a consequence management plan based on the EPA designations for a possible, credible, or confirmed event.
c. Template for a disaster recovery plan that focuses on our critical mission and functions.
d. Support in conducting table top or live exercises.

Appendix G: Selected Utility Comments Not Captured in Survey Database

VA-CIP Project Phase 3 Individual Comments

Following is compilation of comments from utilities that participated in the survey.
These are comments that are not captured in the database.

1. Documentation

- We have a plan but it is questionable whether it should be used – do you really want to operate a valve and bypass the treatment plant?
- Do not know what a consequence management plan is (multiple utilities with this answer)
- Plans were put together by a consultant.

2. Exercises

- Have had two tornadoes and two major storms so we get real practice
- We had a real tornado
- We lack cooperation with other emergency services
- The County does this but does not include the water plant “we don’t carry hoses or guns so we are mostly overlooked – stepchildren”
- Lack of time and funds makes it a bit more difficult to do full scale demos
- Water responsibilities are shared between two people – internal coordination issue for consistency
- We worry about day to day operations more than emergency planning
- The book is on the shelf
- Real life experience with flood and tornado
- Would like to have a successful table top exercise before trying to perform a full scale exercise
- Limited plant involvement to avoid media attention
- Had a real ice storm and ERP functioned flawlessly

3. Performance Metrics

- Even though not having performed an exercise yet, the success of the exercise would have to include: coming up with proper solutions to as many issue's as possible, but even though they may not all get resolved, each issue should be resolved in the best way possible.
- Proper planning prevents poor performance

4. Relationships

- We were more involved before emergency response was transferred to the County

5. Training

- NIMS not even talked about at utility level – this is for management only
- Must be NIMS trained to quality for FEMA grants

6. Challenges

- Always being prepared for the unknown; easy to let your guard down after a long time
- Difficult to make emergency response planning an immediate priority with other things going on
- Training goes out the window during emergencies – people tend to act first and research later

7. Templates

- Consider templates for fire department as they handle response
- Do in winter when staff time more available
- Disaster recovery plans currently do not exist anywhere
- We are a small system and everyone knows everyone in this community so these items not as important
- Anything for free is good
- Want funding assistance “and not just funding to perpetuate bureaucratic re-writing of present laws”

- Any time we can use a template that has worked for someone it's easier to install them than to try and reinvent the wheel, especially when time is so valuable
- Bring in someone for exercises – makes it a bigger deal with staff

8. Other

- Management still does not understand that water is a first responder
- Successful grant for fortified security fence (\$160,000 plus \$25,000 from the City) – hard to do, took 2 years, be persistent (Saginaw)